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ABSTRACT

This report provides a cost-benefit analysis of a program that provides publicly-funded treatment and support for persons who are addicted to alcohol or other drugs and who are judged to be indigent, unemployable, and incapacitated due to their addiction. The study focused on two client outcomes: (1) determine employment outcomes during an 18 month follow-up period; and (2) analyze whether public service costs incurred by treated clients decreased after treatment, giving rise to a potential cost-avoidance effect of public investment in chemical dependency treatment. Data were derived from clients' case records and from persons eligible for the program but who received no treatment. Some of the key findings included positive employment outcomes in which more clients became substantively and continually employed after treatment than did non-clients--even more gained jobs after extra vocational training; a favorable cost avoidance effect of treatment for a majority of clients, with the cost avoidance impact of treatment being largest among younger clients and among clients without mental health problems; and a mortality rate among regular clients that was 5.7 times higher than the general population of the same age and gender. Seven appendices supply methods and statistical models. Contains 38 references. (RJM)

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REPORT

ADATSA Treatment Outcomes: Employment and Cost Avoidance

An Eighteen Month Follow-Up Study of Indigent Persons Served by Washington State's Alcoholism and Drug Addiction Treatment and Support Act

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ADATSA TREATMENT OUTCOMES: EMPLOYMENT AND COST AVOIDANCE

An Eighteen Month Follow-Up Study of Indigent Persons Served by Washington State's Alcoholism and Drug Addiction Treatment and Support Act

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November 1994

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EXECUTIVE SUMMARY
ADATSA TREATMENT OUTCOMES: EMPLOYMENT AND COST AVOIDANCE

The ADATSA program provides publicly-funded treatment and support for persons who are addicted to alcohol or other drugs and who are judged to be indigent, unemployable and incapacitated due to their addiction.

The first purpose of this study was to examine employment outcomes of ADATSA treatment and of three pilot vocational training programs during an eighteen month follow-up period. The second purpose was to analyze whether public service costs incurred by treated ADATSA clients decreased after treatment, giving rise to a potential cost-avoidance effect of public investment in chemical dependency treatment.

Key Findings of the Study

■ POSITIVE EMPLOYMENT OUTCOMES

More clients become substantively employed after treatment and even more do so after extra vocational training. Since most clients who relapse do so within twelve months, the eighteen month follow-up period captures important continuity and substantive earnings aspects of employment. Substantive employment is defined as having continuous work for at least one year of the 18-month follow-up period at wages above the welfare grant level.

■ LOWER PUBLIC SERVICE COSTS

Further use of the most costly public services decreases for most treated clients. Inpatient medical and inpatient treatment for most ADATSA clients and prison confinement for clients with felony offences are the most costly public services whose use decreases after treatment.

■ COST AVOIDANCE EFFECT

There is a favorable cost avoidance effect of treatment for a majority of clients. The addition of cost data (before, during and after treatment) allowed the calculation of the total cost avoided after treatment as a proportion of the expenses for treatment. This provided a cost effectiveness measure of treatment potentially useful to public policy.

■ TREATMENT OUTCOMES VARY FOR SUBGROUPS

Treatment is associated with different employment and cost avoidance outcomes among subgroups of clients. Mental health status, age, gender, pregnancy, and being new to the welfare system were found to be major factors leading to different treatment outcomes on a variety of measures. **On the basis of the findings it may be possible to target appropriate services to particular subgroups of ADATSA clients who need them.**

Study Based On

- case records from the original representative sample of all 909 ADATSA clients assessed and eligible for treatment in the Fall of 1989: 176 clients who were AFDC recipients, 133 clients who were felony offenders and 552 other "regular" clients.
- case records for all ADATSA clients who also received extra vocational services from three pilot programs between August, 1989 and June, 1990 (n=507).
- four years of monthly data (before, during and after treatment) for individual clients matched across four state agencies' records: Employment Security, Medicaid, income assistance eligibility and payment files, corrections, vital records, vocational rehabilitation, Social Service Payment System, and Substance Abuse Management System.

Methods

The outcomes of clients receiving ADATSA treatment were compared with those of persons eligible for but not receiving ADATSA treatment, adjusting for all known differences between these groups.

MAIN FINDINGS FOR REGULAR ADATSA CLIENTS*

Employment and Earnings Outcomes

Substantive-Continuous Employment

Overall, treatment outcomes are positive with regards to substantive employment for most regular ADATSA clients. Completing all treatment is associated with higher earnings. Completing extra vocational training is associated with even higher employment rates and earnings, even for clients with initially low prospects.

After Treatment

- **There is a high continuity of substantive employment after treatment.** 85% of clients substantively employed in the first 6 months after treatment were still substantively employed for the remainder of the 18 month follow-up period.

- **Most clients who receive ADATSA treatment have higher rates of substantive employment than clients who do not receive treatment.** Treatment Group clients had rates of substanstive-continuous employment that were about three times higher than those for Comparison Group clients (19% versus 6%) among all men and among women less than 30. These clients represent 82 percent of all regular ADATSA clients.

After Extra Vocational Services

- **Employment outcomes are best for clients who complete both treatment and extra vocational services provided by one of three pilot programs .** An average of 26 percent of these completers had substantive-continuous employment versus 11 percent for non-completers and 16 percent for the No Extra Training group. Furthermore, certain types of clients who have low prospects of employment (no prior employment, being a woman or older age) also benefit from these extra vocational services.

Earnings

After Treatment

- **Earnings are higher for most clients who *complete* all ADATSA treatment.** For example, the average earnings are $1,049 per month among clients who are substantively employed over eighteen months after completing all treatment. The average earnings are $593 for substantively employed clients who did not receive treatment.

After Extra Vocational Services

- **Earnings of clients completing both treatment and all extra vocational training are even higher.** They are *double* the earnings of those not receiving extra training.

Further Use of Publicly Funded Services

Patterns of Use

Further use of public services varies by type of service. **Use of the most costly services, inpatient medical and re-entry into inpatient treatment, decreases markedly for most treated clients.** Income assistance decreases for some groups of clients. As expected, use of outpatient medical services and re-entry into outpatient treatment tend to remain the same or increase.

Income Assistance

- **Income assistance costs are lower after treatment for clients less than age 30. They are higher after treatment for clients 30 and older and for those with mental health problems.**

- **For clients already on some form of assistance before treatment, the use of income assistance decreases after treatment.**

*NOTE: In this study we use the term "regular" ADATSA clients to refer to the two-thirds of all ADATSA eligible clients who are not AFDC or SSI recipients, or recent felony offenders.

Medical Expenses

- **Treated clients are much less likely to have high inpatient medical costs after treatment if pre-treatment inpatient medical costs were high.**
The average client receiving treatment incurs *half* the inpatient medical costs of the average non-treated client during the same 12 month period. Inpatient medical services are usually due to more severe medical problems, which should decrease with successful recovery .

- **As expected, outpatient medical costs are similar for treated and non-treated clients.** These costs are usually incurred for purposes of health maintenance and are expected to continue for some time after treatment.

Reentry Into Treatment

- **Overall, inpatient and detox re-entry costs are less for treated clients.**
- **The use of outpatient services is similar for treated and non-treated clients.**

Overall Cost Avoidance

High Cost Avoidance for Those With High Prior Costs

In general, the findings among most ADATSA clients suggest a favorable overall impact of treatment on cost avoidance when the confounding "gateway" effect is eliminated. (This gateway effect is an expected increase in services and costs for clients who are new to the welfare system when entering ADATSA.)

- **Clients with high pre-treatment costs have lower costs after treatment.** ***The higher the treated clients' pre-treatment costs, the higher the cost avoided.***

- **For those persons on some form of publicly funded services before treatment, the first year cost avoidance rate is 23 percent: $491 avoided of $2,114 spent on ADATSA treatment.** Assuming the same cost avoidance rate continues, public service agencies would "recover" the amount expended for these clients' treatment in about four years.

- **The two major reasons for the overall cost avoidance result are lower inpatient medical costs and lower re-entry into inpatient treatment.** These are both high cost services.

Subgroup Differences

Groups With High Cost Avoidance

The cost avoidance impact of treatment is largest among younger clients and among clients without mental health problems.

Clients Less Than Age 30

- **Treated clients who are younger than 30 years have cost avoidance rates in the 40 to 50 percent range.** These younger clients constitute more than a third of all regular clients.

No Mental Health Problems

- **Treated clients without mental health problems have a cost avoidance rate of 21 percent.** These clients represent three quarters of all regular clients.

- **Treated clients without mental health problems who were receiving publicly funded services before treatment have a cost avoidance rate of 36 percent.** Clients with these characteristics represent almost half of all regular clients.

Group With No Cost Avoidance

There is no cost avoidance following treatment for men 30 or older.

- **Men 30 or older have lower inpatient medical costs, if treated, but higher income assistance and inpatient re-entry costs. *The net result is no cost avoidance.***

Groups With Cost Increases, If Treated

*There are cost **increases** for the following groups of clients if treated:*

Pregnant Women

- **They constitute a very small group of women, pregnant at the time of ADATSA assessment (2 percent of all regular ADATSA clients studied).**

Their costs increase considerably after treatment ($4,352), mainly due to higher medical costs, presumably related to their use of perinatal services.

Women 30 or Older

- **They represent another small group of women, age 30 or older (16 percent of all regular ADATSA clients studied).**

These women have higher income assistance and medical assistance costs if treated. They are less likely to be substantively employed and have lower earnings. These findings should be interpreted with caution given the small number of cases in this subgroup. Further studies should test whether ADATSA treatment meets the needs of these women, particularly their employment needs.

Clients With Mental Health Problems

- **These clients comprise a relatively large group (24 percent of all regular ADATSA clients studied).**

They have higher costs if treated, including higher income assistance and higher inpatient treatment re-entry costs. The total cost increase if treated is substantial. It represents 37 percent of the original expense for treatment. They also have poorer employment outcomes. This was expected. The research literature on chemical dependency treatment effectiveness predicts poorer outcomes for persons with a low level of psychiatric functioning. Furthermore, there is a lack of sufficient ADATSA funding of inpatient programs appropriate for clients who are also mentally impaired. Finally, irrespective of treatment effectiveness, these clients may need more services. If treated, more of the clients may be obtaining additional services which they need.

Gateway Clients (clients newly entering publicly funded services)

- **These are an even larger group of clients (33 percent of all regular ADATSA clients studied) who were newly applying for assistance along with ADATSA treatment.**

The cost increase incurred by gateway clients in the first year constitutes 17 percent of the original expense for treatment. Treated clients in this group become eligible for and incur similar costs for income assistance and medical assistance as those for non-treated clients who newly apply. If treated, they incur higher re-entry costs suggesting both continued need and easier access to further treatment once treatment has been obtained. This was expected.

Mortality

High Mortality Rate

The unadjusted mortality rate among regular ADATSA clients was found to be 5.7 times higher than the general population of the same age and gender. This was expected due to the known higher health problems, suicides, and violent deaths among chemically dependent persons.

Lower Deaths Among Treated Clients

Of interest was whether there was any evidence for treatment lowering this high mortality rate. **The tentative unadjusted findings for regular ADATSA clients show that treated clients had proportionally fewer deaths in the eighteen month follow-up period. Furthermore, deaths among treated clients tended to occur sometime after treatment, perhaps after relapse, while deaths in the Comparison Group tended to occur soon after the assessment for chemical dependency.**

These findings should be interpreted with caution since they are based on deaths occurring over a relatively short period of time and without statistical adjustment.

MAIN FINDINGS FOR SPECIAL GROUPS OF ADATSA CLIENTS:

AFDC Recipients and Felony Offenders

AFDC Recipients

These clients were presumed to be less likely to be employed due to their extra child care responsibilities. They were expected to continue relying on publicly funded services even if treated. **Surprisingly, our tentative findings suggest favorable employment outcomes following ADATSA treatment for all these clients and cost avoidance effects for many who were not pregnant and had no mental health problems.**

These findings should be interpreted with caution since the full adjustment of the outcomes were impeded by the small number of AFDC recipients in the sample.

Felony Offenders

We found a trend of unexpectedly favorable employment and earnings outcomes among felony offenders completing all treatment. No favorable employment outcomes of treatment were expected among these clients because of their double disadvantage of being both recovering drug addicts or alcoholics and ex-convicts.

Publicly funded services costs were anticipated to increase among treated clients. **Our data supported a trend in this direction: the tentatively adjusted costs for all types of public services appeared to be higher for treated clients.**

Confinement costs were expected to decrease, at least temporarily, after treatment while clients were under community supervision and had aftercare support. **These confinement costs in fact appeared to decrease: the unadjusted costs are $3,015 for Treatment Group clients compared to $4,185 for Comparison Group clients. This would result in a cost avoidance trend of $1,170.**

The net result of these cost trends is a moderate cost avoidance effect of treatment, since the decrease in confinement costs is greater than the increase in publicly funded services costs.

These are tentative findings due to the small number of felony offenders in our sample, the limited statistical adjustments possible and the complex patterns and timing of entries and exits from prison. Further research is needed to extricate these patterns and statistically confirm the above trends.

1

INTRODUCTION

STUDY PURPOSES

Employment Outcomes of ADATSA Treatment

This study examines whether the generally positive employment outcomes of ADATSA treatment, reported in an earlier ADATSA study, (Longhi, et. al., 1991) continued through eighteen months. The earlier study followed clients for six months. After that time, the employment status for some clients could have changed, possibly due to relapse.

Since research findings show that relapse most often occurs within twelve months, this eighteen month follow-up period is long enough to capture most of the effects of treatment on employment. It allowed us to identify various patterns of employment and to define a measure of continuous and substantive employment. We were then able to assess the impact of treatment on this kind of employment for major groups of ADATSA clients.

Employment Outcomes of Extra Vocational Services

Similarly, this study tests more thoroughly the effects on employment of adding extra vocational training to regular ADATSA treatment. Clients of three pilot programs providing vocational services were followed up for the same eighteen months. We assessed whether their substantive-continuous levels of employment were higher than those of clients receiving ADATSA treatment alone and which groups of clients benefit most from these extra services.

Cost of Continued Reliance on Publicly Funded Services and of Treatment Reentry

The addition of cost data in this study allowed us to conduct a cost avoidance analysis of ADATSA treatment. This involved examining costs before, during and after treatment. The costs of client use of two major assistance programs (welfare grants and medical coverage), as well as those for prison confinement and re-entry into chemical dependency treatment were included.

This study assesses the effect of ADATSA treatment on the following:

- changes in use of income assistance as well as in medical care services paid by Medicaid, which is the most expensive of all publicly funded services,
- changes in use and costs of substance abuse treatment re-entry (in light of the common expectation that multiple treatment episodes are necessary for successful recovery), and
- costs of prison confinement for clients with felony offenses.

We were able to calculate the total amount of direct public costs avoided and express it as a percentage of the cost of treatment itself. This provided a measure useful for public policy: the cost avoidance rate of ADATSA treatment. By applying this measure to major subgroups of ADATSA clients, we assessed differences in the cost avoidance effect of treatment.

UNINTENDED BENEFIT OF THIS STUDY

Identification of Differential Outcomes Among Subgroups of Clients

As we tested for the main effects of treatment, controlling for different background characteristics of clients, we made various discoveries.

- Treatment sometimes had no effect when averaged over all clients, but had significant effects among particular subgroups of clients
- Particular combinations of client background factors lead to high or low prospects of favorable outcomes irrespective of treatment.

In this study we analyze and discuss systematically major subgroup differences in outcomes which appear consistently on various measures of employment and cost avoidance.

STUDY BACKGROUND

ADATSA Program Goals

The ADATSA program treats adults addicted to alcohol or other drugs who are indigent, unemployable and incapacitated due to their addiction. A maximum of six months of treatment and financial support is provided in any two-year period. The immediate goal of the program is abstinence. Ancillary goals include improved personal coping skills, vocational skills and social skills. Success in moving towards these goals is expected to result in improvements in reaching the long-term goal of self-sufficiency. Important components of self-sufficiency are employment and a reduced reliance on public assistance programs.

Treatment Programs

ADATSA-eligible clients are placed in appropriate treatment programs within the constraints of availability due to limited funding and long waiting lists. Treatment programs are arranged in different treatment paths, each involving primary care, reintegration and aftercare components. The tracks differ in total duration, in emphasis, and in whether a residential setting is used for the primary and reintegration components. In residential programs clients are provided room and board along with treatment. While participating in outpatient programs, clients receive a living stipend, in addition to food stamps and medical coverage.

Treatment Episodes and Expected Outcomes

Due to the nature of addiction, it is recognized that more than one treatment episode may be required for stable recovery (Jaffe, 1984; Hser, et. al., 1988). Some long term studies indicate that less than half of those treated are expected to fully succeed. Typically, about one out of three or four clients reduce their chemical dependency after any given treatment episode. This report deals with the employment and cost avoidance outcomes of one such treatment episode (Catalano, et. al., 1988). It also includes a study of the employment outcomes of a particular set of clients who received extra vocational services during or after one ADATSA treatment episode.

THE SAMPLE

Regular ADATSA Clients and Special Groups

The persons studied for the general treatment outcomes are a statewide representative sample of 909 ADATSA clients assessed and found eligible for ADATSA treatment between August 1 and November 30, 1989. The main group of clients analyzed is composed of regular ADATSA clients, who constitute about two thirds of all ADATSA eligible clients. This main group excludes special groups of persons whose statuses strongly limit the likelihood of employment: death, physical disability, recent criminal felony offenses, and welfare aid due to dependent children (See Appendix 1, Figure 1 for all sample sizes). A separate chapter presents the treatment outcomes for the two largest special groups: clients who were also recipients of Aid to Families with Dependent Children (AFDC) and clients with recent felony offenses.

Group Receiving Extra Vocational Services

For the investigation of the effects of obtaining extra vocational services, an additional sample of 507 ADATSA clients was drawn. They were selected from among those ADATSA clients who had received services from any of three pilot vocational training programs: Rapid Rehabilitation Resolution in Spokane, ADATSA Cooperative Employment Program in Seattle, or Vocational Opportunity Training/Education in Tacoma. The selected clients were all ADATSA clients who had undergone vocational training during the fall and winter of 1989; that is, approximately the same time as the 909 persons in our representative sample of all ADATSA clients who underwent treatment. As a result, the employment outcomes of those receiving extra vocational services in addition to ADATSA treatment could be compared to the same outcomes for those receiving only ADATSA treatment.

STUDY DESIGN

Treatment and Comparison Groups

In order to assess the effects of ADATSA treatment, the outcomes of clients receiving the treatment (the Treatment Group) are compared with those of persons eligible for, but not receiving the treatment at the scheduled time (the Comparison Group). (See the profiles of these two groups in Appendix 1, Figure 2. They differ mainly in the proportion of clients who have mental health problems and physical problems. See multivariate statistical tests of differences in Longhi, et. al., 1991: 58-62.) Other univariate differences include: proportion having no public assistance costs before; having prior criminal justice involvement; being hard drug users; and having a higher prior monthly wage. This kind of analysis looks for differences in outcomes between the Treatment and Comparison Groups which are not due to identified causes other than treatment.

Similarity of Groups

The first control procedure is to identify naturally occurring groups which are as similar as possible other than for differences in treatment. In this study clients in both Treatment and Comparison Groups were similar in the following ways: they were all indigent, unemployable and incapacitated due to chemical dependency; they had sought assistance at their local Community Service Office during the same period; they had sufficient motivation to show up for their appointment at the ADATSA Assessment Center; and they were assessed and found to meet the requirements for ADATSA eligibility. Among persons with these characteristics, those in the Treatment Group were the ones who both chose to participate and showed up for treatment at the scheduled time. Those either not accepting (and/or not being accepted for) a particular treatment plan, or not showing up for treatment formed the Comparison Group. (See Appendix 1 for a more detailed methodological discussion.)

Statistical Controls for Background Differences

The second procedure used here to control for effects other than treatment is to measure and statistically control for all known differences between Treatment and Comparison Groups which may affect outcomes. In this study fifty possibly important background characteristics and prior experiences were obtained from various individual case records for all clients in both groups. The impact of these fifty prior factors on outcomes was assessed and statistically controlled. (See Appendix 1 for details.) The magnitudes of these statistical adjustments can be assessed by comparing the adjusted and unadjusted outcomes presented in Appendix 8, Figure 3. In this way the obtained outcome differences between Treatment and Comparison Groups, other than for possible selectivity effects discussed in Appendix 1, could be attributed with some confidence to the effect of treatment.

This research design was the best one available short of an experimental design. The latter would involve randomly assigning persons to either a Treatment Group or a Control Group (i.e., providing persons with access, or no access, to treatment based on chance alone). The purely random assignment to treatment and control groups guarantees that the groups are similar, except for chance variations, before treatment. However, the impracticality of such a research design for ethical, human rights, and legal reasons in treatment situations such as this one makes designs with naturally occurring groups and statistical controls much more common. (See Kleinbaum et. al., 1982).

Study Advantages

Avoidance of Major Drawbacks of Retrospective Studies

Many follow-up studies on the effects of treatment are based on self-reported data obtained by interviewing clients after a certain period of time. These studies have the advantage of allowing researchers to first select the information needed and then to ask for it in the most appropriate way. The major drawbacks are the following:

- Clients often cannot be contacted and/or refuse to participate in the study. Thus, the reported findings are based only on those who are reachable and cooperative. These persons are presumed to have better outcomes than those who are unreachable and uncooperative and therefore the findings may be biased.
- Clients may not report correctly their situation after treatment either purposely or due to difficulty in recalling accurately past events or unpleasant occurrences.
- If clients are contacted often for information (before, during and after treatment), responses may be biased by the assessment process itself.

Monthly Data Before, During and After Treatment

This study avoids these disadvantages by using state records collected unobtrusively on all clients. Employment data for each quarter of a four year period were retrieved, covering eighteen months before and after treatment and up to twelve months during treatment. Data on the cost of public services for each month of a three-year period were retrieved covering twelve months before and after treatment and up to twelve months during treatment.

These electronic data contain some errors; i.e., there is some mistaken recording or processing of data by staff. Such errors were kept to a minimum by careful identification and correction efforts in the course of preparing data files for analysis. Further, these kinds of errors are likely to occur unsystematically for both the Treatment Group and the Comparison Group. As a result, they are unlikely to seriously bias the findings in favor of one group over the other.

Matched Data from State Records

The state records we accessed are the following:

- quarterly employment information from Employment Security, reported by employers statewide,
- medical care payments from the Medicaid database, reported by medical providers,
- public assistance utilization from the Economic Assistance eligibility and monthly payment files,
- involvement in felony offenses from the statewide Department of Corrections files, and
- utilization of substance abuse services from the Social Services Payment System (which sends monthly checks to contracted providers for some services), from the Substance Abuse Management System files, and from the paper case files maintained by counselors at ADATSA Assessment Centers.

The result is a more accurate picture of events for a larger proportion of sampled clients and for a longer period of time than is normally possible in a retrospective study using self report. (See the relatively high match rates in Appendix 1, Figure 1.)

Study Limitations

Lack of Information on Sobriety

Information on sobriety and related improvements in the quality of life is unavailable. We can only test for their presumed consequences on employment, health care costs, income assistance, criminal involvement and further use of treatment services. In other words, the evidence of the treatment effects on sobriety is indirect.

Unmeasured Differences Due to Selectivity

There are still problems due to selectivity: the possible differences in unmeasured factors between the Treatment and Comparison Groups. This fact suggests caution in interpreting the outcome results as exclusively a product of treatment. Only an experimental design can overcome this limitation. However, confidence that treatment was impacting clients in different ways is enhanced by the consistent pattern of interpretable effects on a variety of outcomes: various measures of employment, income assistance, medical costs and re-entry into treatment.

Analysis of Only Major Subgroups Differences

The demands resulting from the necessity to statistically control for differences in client backgrounds led to an exploration of the most central and consistent factors which differentiated clients who had the best and worst treatment outcomes. These factors may be a function of other prior conditions. For example, older clients may be less likely to be employed due to longer addiction or to job discrimination due to

their age. However, this study was not intended to unravel this kind of complex pattern of causes. It focused on assessing treatment outcomes for all clients and for large, clearly identifiable groups of clients who consistently had different outcomes across various measures of employment and various types of public assistance.

PRESENTATION OF FINDINGS

Focus on Ease of Understanding

The authors' objective was to make the findings understandable to a wide audience, without assuming specialized knowledge in statistical techniques or particular academic disciplines. Since technical terms were avoided and findings were presented in the simplest graphical forms, possibilities of misinterpretation may arise concerning the link of the text and graphics to the actual statistical models displayed in the Appendices.

Technical Qualifiers

The following qualifiers may be useful to the reader:

Statistics

Unless otherwise stated, only statistically significant results based on adjusted data and projections from statistically significant models are discussed in the text. The statistical details, customary in technical writing, are generally omitted from the body of this report. For purposes of documentation and for the more technically versed reader, the degrees of significance and the magnitudes of additive and interactive effects of specific variables are displayed in the appendices. They are presented as part of the statistical models from which they were derived.

The reader is explicitly cautioned in the text when exceptions are made to the above rule. Results which do not fully meet criteria of statistical significance at the (.05 level), and/or are not based on adequately adjusted data, are qualified as "trends" or "tentative and exploratory." This often occurs in the last chapter, Chapter 7, which is entirely focused on exploratory analyses of the treatment outcomes of smaller, special groups of ADATSA clients. This occurs infrequently in other chapters: only in instances where the importance of the inquiry justifies such exploratory analyses.

Figures

Only the adjusted results are presented, in simplified bar graph form, in the body of the report. These graphs show expected client outcomes for Treatment and Comparison Groups assuming that these groups had similar background characteristics: i.e. client outcomes were adjusted for possible differences between Treatment and Comparison Groups.

The adjusted results are based on the calculations of the main effects and interactive effects of treatment with various background character-

istics, plus the effect of the background characteristics on outcomes irrespective of treatment. A description of the calculation steps are presented in Appendix 1. The effects of the overalll adjustments are displayed in Figure 3, Appendix 1. The statistical models related to each outcome variable, including the significance levels for each independent variable, are displayed in the various Appendices.

Main Subgroups and Main Client Characteristics Discussed

Many client background characteristics and experiences were found to affect outcomes: some unique to specific outcomes, some related to outcomes irrespective of treatment, some interacting with treatment.

This study was designed to test only main effects of treatment, not all possible interactions of treatment with particular outcomes. Funding and timing constraints precluded further analysis of many interaction effects. Therefore, not all characteristics or subgroups identified in the statistical models are discussed in the text.

Included in the Body of the Report

Outcome results by age, gender and mental health status are almost always presented, since these background characteristics were found to be the most commonly influential across different outcome measures. The "gateway" effect (the effect of being relatively new to the welfare system) is presented when discussing potential cost avoidance results of treatment because of its confounding effect in the process of identifying cost avoidance due only to treatment. See Appendix 1, Figure 4 for the proportion of clients in the main subgroups.

The combined effects of the presence or absence of all relevant background characteristics are presented in the form of adjusted outcomes for high or low prospect clients. This was done in order to provide the reader with a sense of the overall impact of the presence or absence of these important pre-treatment characteristics on the given outcome studied.

Excluded from the Body of the Report

Background characteristics which affected only one or few outcome results are not systematically presented in the text, unless their effect was very large. For example, the effect of pregnancy was discussed even though it affected only few cost outcomes. The reason was the magnitude of the effect which affected overall costs.

Appendices

Included are the original zero order correlation coefficients, when significant, and the coefficients and significant levels of the final statistical model for each treatment outcome. Results of all the stepwise testing of the statistical models are not presented.

ORGANIZATION OF THE REPORT

Each chapter of the report addresses a specific treatment outcome issue as outlined below:

Chapter 2: Employment Outcomes for Regular Clients Receiving ADATSA Treatment

This chapter addresses the issue of continuity of employment after treatment. Employment patterns throughout the eighteen month follow-up period are analyzed and three different aspects of employment are identified: any employment, continuous employment at a substantive level, and average overall earnings. Statistical tests are conducted to establish whether or not clients who received treatment had better employment outcomes than comparison clients in each aspect of employment measured. As a result of these tests, subgroups of clients are found to have very different prospects for employment. Their different levels of employment and earnings are estimated based on the statistical models obtained.

Chapter 3: Employment Outcomes for Regular Clients Receiving Extra Vocational Services

In this chapter statistical tests are conducted to ascertain whether the extra vocational training provided by three pilot programs led to better employment outcomes. The levels of employment and earnings obtained by vocationally trained clients are compared to those of ADATSA treated clients who lived in the same geographical areas and entered the labor market at approximately the same time. Particular attention is paid to whether outcomes of vocational training vary depending on the pre-training characteristics of clients and the degree of completion of training.

Chapter 4: Continued Reliance on Income and Medical Assistance by Regular Clients After Treatment

In this chapter, reasons are discussed for modifying the general expectation that all clients would decrease their use of income and medical assistance after treatment. Chemically dependent persons who have additional physical and mental health problems present complicating circumstances. These may lead to higher use of certain public assistance services after treatment than before treatment. Furthermore, clients not in the welfare system at the time of referral may also become newly eligible for a variety of assistance programs concurrently with ADATSA treatment, resulting in post treatment increases in service utilization. Both the general and modified expectations are tested in terms of the proportion of clients using these services and the total costs incurred by the average client throughout the follow-up period. Once again emphasis is placed on the different experiences of subgroups of ADATSA clients.

Chapter 5: Re-entry into Treatment by Regular Clients

This chapter begins by contrasting the current expectation, that multiple treatment episodes are necessary in treating addiction, to the traditional expectation that one intensive treatment episode should suffice. We then review the more realistic expectations regarding chances of treatment success after any given episode. In order to test these expectations, two types of re-entry are distinguished: re-entry into inpatient and detox programs (usually indicating relapse), and re-entry into outpatient programs (often for continued aftercare support). The results are discussed both in terms of the proportion of clients returning to treatment and the further costs of such re-entry. The high rate of re-entry for ADATSA treated clients who have mental health problems is discussed at some length.

Chapter 6: Total Cost Avoidance Effects of Treatment for Regular Clients

The major objective of this chapter is to test whether treatment resulted in an overall avoidance of further costs for public service agencies. Also of interest is the identification of which costs were reduced most among the ones included: income, medical, or treatment. Finally, the total adjusted costs avoided are expressed as a proportion of the amounts expended for treatment. The resulting cost avoidance rates for any group of clients facilitate making comparisons across subgroups. We discuss the differential effectiveness of treatment in reducing these types of costs by age group, gender, mental health status and whether the client has previously been introduced to the system of public assistance.

Chapter 7: Special Groups of ADATSA Clients: AFDC Recipients, Felony Offenders, Clients Who Died

In this chapter we explore how employment and cost avoidance outcomes are different for treated clients in two special groups: recipients of Aid to Families with Dependent Children (AFDC) and felony offenders. Unexpectedly, positive outcomes were discovered. However, due to the small number of clients sampled in this study, further research will be needed to test the questions raised by our findings.

The chapter also addresses two questions regarding mortality among ADATSA clients:

- How much higher are the risks of dying among different ADATSA groups compared to the general population of the same age and gender?
- Is the mortality rate for the Treatment Group lower than that for the Comparison Group?

Information from the Office of Vital Records provided us with the identities and causes of death for ADATSA clients who died during the eighteen month follow-up period. On this basis we calculate the mortality rates of regular ADATSA clients, AFDC recipients and felony offenders. Among the larger group of regular clients, we then explore whether treatment lowers the risk of dying.

EMPLOYMENT OUTCOMES FOR REGULAR ADATSA CLIENTS DURING EIGHTEEN MONTHS AFTER SCHEDULED TREATMENT

2

In this chapter, we focus on employment outcomes of ADATSA treatment. We examine patterns of employment and earnings to determine the timing and definition of a continuous pattern of employment which would provide substantial earnings over the 18 months after treatment. After identifying this substantive-continuous pattern, we test whether employment outcomes are better for clients who received treatment than for those clients who became eligible but did not obtain treatment.

The employment outcomes of regular ADATSA clients are analyzed, excluding special groups whose circumstances were presumed to strongly limit the likelihood of employment: clients who died, clients with physical disabilities (SSI), recipients of Aid to Families with Dependent Children (AFDC) and clients who were convicted of felony offenses during the year prior to treatment. (The treatment outcomes for some of these groups are discussed separately in Chapter 7.)

The Importance of Employment as an Outcome of ADATSA Treatment

From the viewpoint of clinicians, the focus on employment as a treatment outcome is prompted by the fact that sobriety and improved life and social skills should lead to more self-sufficiency. Employment is seen as the major way to reach economic self-sufficiency.

From a legislative viewpoint, the emphasis on the goal of self-sufficiency also stems from the public policy interest in minimizing continued client dependence on publicly funded services. Self-sufficiency, and particularly its employment component, should achieve this.

Self-sufficiency is clearly not the only nor the first goal of treatment. Sobriety is generally perceived as the major goal. Furthermore, sobriety is expected to affect favorably other client behavior in addition to self-sufficiency, such as improving their social relationships and the health and well-being of their dependent children (if any). Therefore, the ADATSA program was established to provide a constructive alternative to the practice of either ignoring or jailing addicts or, alternatively, of maintaining these individuals on the welfare rolls as unemployable due to physical or psychological problems. This constructive alternative is based on the assumption that treatment would lead to sobriety which would lead to greater self-sufficiency.

Another component of self-sufficiency is less reliance on a variety of publicly funded service programs. The question of whether this reliance decreases for treated clients will be addressed in later chapters.

The Organization of This Chapter

This chapter is organized in four sections. In each of these sections, the employment outcomes for clients in the Treatment Group are compared with the outcomes for clients in the Comparison Group. That is, we compare what happened to those who received ADATSA treatment with what happened to those who did not obtain ADATSA treatment at the scheduled time.

Section 1: Continuity of Employment

The first section examines the issue of continuity of employment: whether treated clients tend to *stay employed* once they gain employment. The earlier ADATSA study examined employment only in the first six months after treatment. The question addressed in this section is whether they remained employed after these first six months.

The remaining three sections deal with different aspects of employment over the entire 18 month follow-up period. Each section tests whether treatment affects the particular aspect of employment under consideration.

Section 2: Any employment

The second section deals with the issue of whether treated clients are more likely to obtain any employment at all, however brief, including employment that is part-time or at very low wages.

Section 3: Substantive-Continuous Employment

The issue addressed in Section 3 is whether treated clients are more likely to achieve continuous employment (for 12 months or more) at a substantial earnings level.

Section 4: Overall Average Earnings

Section 4 addresses the issue of whether the average monthly earnings per person over the whole follow-up period is higher for treated clients. This aspect of employment is more sensitive to individual differences since it is a continuous measure (dollars) as opposed to being a yes/no measure on whether the client meets specified criteria for employment.

Expectations Regarding Levels of Employment Outcomes

As already mentioned, employment rates and average earnings were expected to be higher among clients obtaining ADATSA treatment. The logic underlying this expectation is that treatment would lead to higher levels of sobriety, which, in turn, would increase the likelihood of employment. Expected employment rates are a function both of the chances of successful stable recovery after the current treatment episode, and of the more general chances of employment for persons with the background characteristics of ADATSA clients.

Employment as a Function of Recovery

Regarding chances of full recovery, some long term studies suggest that less than half of all treated individuals in the general population are expected to reach stable recovery in the long run. For any one treatment episode even fewer, one fourth to one third of all clients, are expected to succeed (see Catalano, et.al., 1987). If these rates also apply to ADATSA clients, then, at best, only one out of three or four is expected to become successfully employed. Even this relatively low proportion would be achieved only if all ADATSA clients who were treated succeeded in overcoming the handicaps of their background characteristics in entering the labor market, as will be discussed next.

Employment as a Function of Common Backgrounds of ADATSA Clients

Regarding general handicaps to employment, we note that ADATSA clients had certain common characteristics by reason of eligibility requirements for ADATSA: they were indigent, unemployed and deemed unemployable due to severe dependence on drugs and/or alcohol at the time of assessment. For the average regular ADATSA client this dependence was a result of about sixteen years of use, often involving prior detoxification episodes and prior attempts at recovery (see Figure 1, Chapter 7, where the profiles of regular clients are compared to those of all ADATSA clients and those of special groups excluded from these analyses). The stigma of "once an addict always an addict" would have to be overcome and employers would have to accept the risk of hiring persons with such past chemical dependence.

Employment as a Function of Specific Liabilities

Furthermore, many regular ADATSA clients had other liabilities (see Figure 1, Chapter 7). For example, many had little prior work experience in the context of a job market where getting a job is often based on success in previous jobs. Many had been involved with the criminal justice system and employers are often reticent to employ persons with criminal records due to their high risk of recidivism. A large minority (one in four or five) were judged to have extra problems: emotional/mental problems and/or physical problems. A large minority were also homeless or living in shelters before treatment. These are all extra factors limiting the likelihood of employment.

General Expectation

A realistic appraisal of all these handicaps leads to a much more modest expectation of improvement in employment than would be warranted simply by examining the likelihood of short term sobriety after treatment. Specifically, we expected *fewer* than one in three or four clients to be continuously-substantively employed after treatment. For particular groups of clients with a combination of handicaps the expected employment prospects are even lower. How much lower is difficult to predict and is one of the reasons for this research.

Different Treatment Outcomes Among Subgroups of Clients

It is partially the task of this chapter to identify some of the most immediate handicaps affecting employment outcomes among regular ADATSA clients. In this way we can begin identifying some of the subgroups which share these handicaps and estimating the number of clients in these subgroups. It is then possible to test whether treatment affects employment outcomes more among some clients and less, or not at all, among other clients.

General Study Methods

Among regular ADATSA clients, we identify groups of clients on the basis of background factors which most influence the likelihood of employment. We test whether these background factors influence the way treatment leads to employment outcomes. By controlling for all these factors, we are then able to estimate the levels of employment reached after treatment by the average client, by clients in particular subgroups, and by clients with initially high or low employment prospects.

Source of Employment Information

Employment data were supplied by the Department of Employment Security, which has data on a quarterly basis on most employment in the state. Since some employment is not covered, the employment data reported here are probably underestimates of the actual number of ADATSA clients who were employed. For example, persons who were employed out of state or who moved out of state cannot be tracked. In addition, some employers do not report hours of earnings to Employment Security, including those not legally required to do so (15%) and those who pay cash.

While underestimation should be assumed, we have no reason to believe that this affected any subgroup of clients more than another; therefore, the comparisons between client subgroups, which are the core of the analysis, are unlikely to have been substantially affected.

Section 1: Continuity of Employment

The Issue

The issue of continuity of employment was raised after the 1991 ADATSA report found evidence for better employment outcomes among treated clients in the first two quarters after treatment (see Longhi, et. al.,1991, p. 68). The issue for that study was whether the *same* clients were employed both quarters or whether some were employed the first quarter, others the second quarter. This would give the appearance of continuity of employment among the same clients while, in fact, these clients were intermittently employed.

The same continuity concern was expressed for the additional twelve months of client data collected for the current study, which extended the follow-up period to a total of eighteen months. The issue of continuity now became a question of whether clients who had been employed in the first six months were the same clients employed in the next twelve months. Conversely, if a client was not employed in the first six months, was that same client likely to be employed in the next twelve months.

Types of Employment

In order to answer this question we use three employment statuses: *substantive employment, some employment (i.e. any employment at all), and no employment.*

The differentiation between substantive and any employment is necessitated by the observation that some employed clients were clearly part-time, intermittently employed or receiving very low wages in any given quarter. Substantive employment is defined as employment with average earnings above the General Assistance-Unemployable (GAU) monthly grant ($314-$339 over this period). This level also corresponds to an empirically observed break in earnings between those clients employed part time and those at or close to full-time.

Findings on Continuity of Employment Among Treatment Group Clients

For clients in the Treatment Group the major findings are:

- **There is high continuity among treated clients who were substantively employed in the first six months after treatment.** Among those clients, 85 percent were still substantively employed for the remainder of the 18 months (see Figure 1).
- **Having some employment, but not at a substantive level, can be a good start.** Among those who had some employment in the first six months, 35 percent achieved a substantive level of employment in the following 12 months, and 35 percent continued having some employment, so that 70% were employed to some extent.

- **No employment in the first 6 months is highly predictive of a continued lack of employment thereafter.** Of those not employed in months 1 through 6, 73 percent continued to be unemployed during months 7 through 18. Twenty-two percent managed to get some employment. Only 5 percent achieved substantive employment.

Findings on Continuity of Employment Among Comparison Group Clients

The pattern of findings reported above is true for both Treatment Group and Comparison Group clients.* The *level* of employment was different for the Comparison Group, but this will be analyzed, with all the appropriate adjustments, in the next three sections of this chapter.

General Conclusion on Timing of Employment

Regarding the timing of employment, what happens in the first six months appears to be strongly related to substantive employment in the 12 months thereafter. However, about 14% of the clients are "late starters," achieving 12 months of substantive employment in months 7 through 18 after not being substantively employed in months 1 through 6.

Specific Conclusion on the Definition of Substantive-Continuous Employment

These patterns of employment led us to conclude that the following conditions should define substantive-continuous employment in the remaining analyses:

> Continuous employment for at least the last 12 months of the 18 month follow-up period, at wages above the welfare grant level.

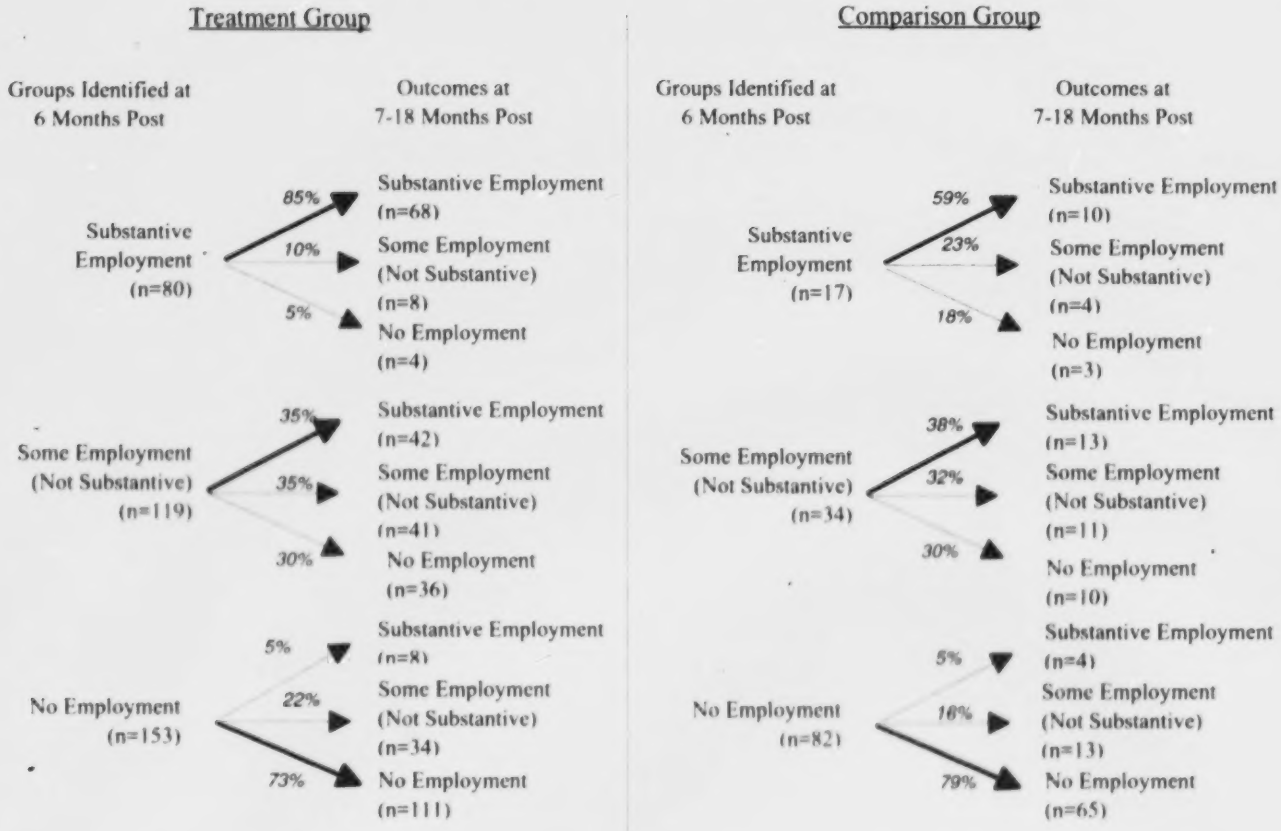
This definition allows us to include as substantively employed not only those who were so employed for the whole 18 months, but also many of the important minority who were late starters.

* Note: The minor exception was the lower rate of continuity of substantive employment for Comparison Group clients (59 percent versus 85 percent among treated clients). However, this is not statistically significant due to the small number of clients substantively employed among Comparison Group clients.

Figure 1

Degree of Continuity and Level of Employment in the Total 18-Month Follow-up Period

For Clients Initially Employed at a Substantive Level, Not Substantive Level or Not Employed at All*



*Substantive employment is defined as employment with average earnings above the General Assistance -Unemployable (GAU) monthly grant ($314-339 over this period). Earnings data are from the Department of Employment Security.

Section 2: Clients Having Any Employment After Treatment

Overall Level of "Any Employment", Including Temporary, Part-time Employment

Treatment was found to have a favorable outcome, in terms of increasing chances of obtaining any kind of employment, only among those clients who had some recent prior employment experience.

The overall level of "any employment", (including temporary, part-time employment) was *significantly higher* for treated clients who had some previous employment in the 12 months prior to treatment. These higher levels were found to exist irrespective of differences in other client backgrounds. For those clients with previous employment, the average adjusted rate of any employment was 83 percent among clients in the Treatment Group compared to 65 percent among clients in the Comparison Group.

On the other hand, for clients with no previous employment in the 12 months prior to treatment, the rates of "any employment" were *uniformly low:* 38 percent among Treatment Group clients, 46 percent among Comparison Group clients. (The differences between these groups were not statistically significant).

Other Factors Related to "Any Employment": Clients with High or Low Employment Prospects

Two client background factors are related to "any employment" in addition to treatment and prior employment: having physical problems and having mental/emotional problems.

The lack of mental or emotional problems and the lack of physical problems both dramatically increased the likelihood of employment. Thus clients without these problems were considered to have high employment prospects. The presence of these problems defined clients with low prospects of employment. The statistical model allowed us to project employment results for these sub-groups.

Among treated clients with no prior employment, the chances of obtaining "any employment" after treatment are estimated to vary from 15 percent among low prospect clients to 52 percent among high prospect clients.

Among treated clients with prior work experience, rates of "any employment" are expected to be 53 percent among low prospect clients and 87 percent among high prospect clients.

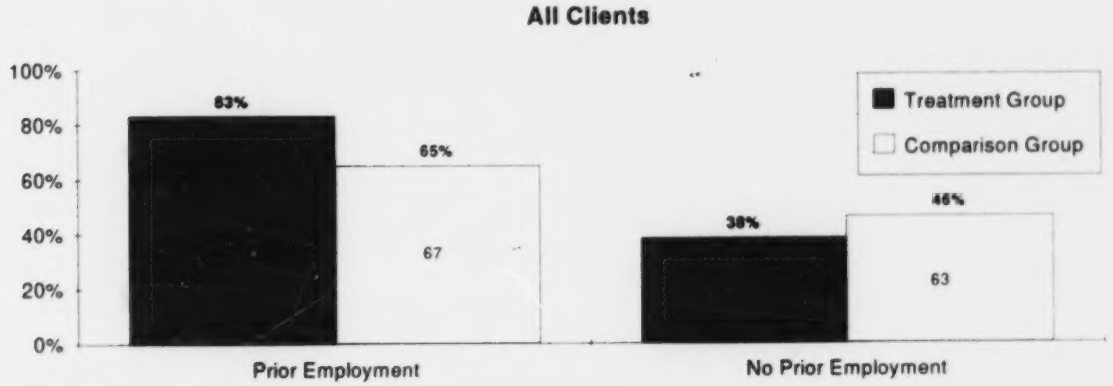
Figure 2

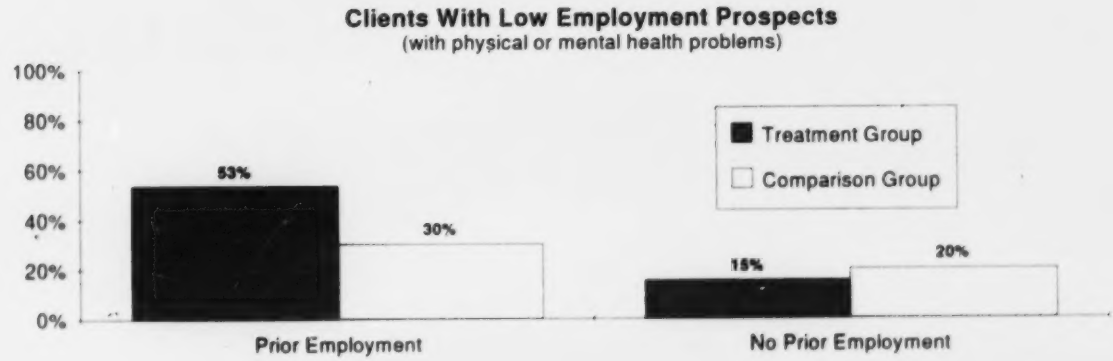
RATES OF ACHIEVING ANY EMPLOYMENT AT ALL

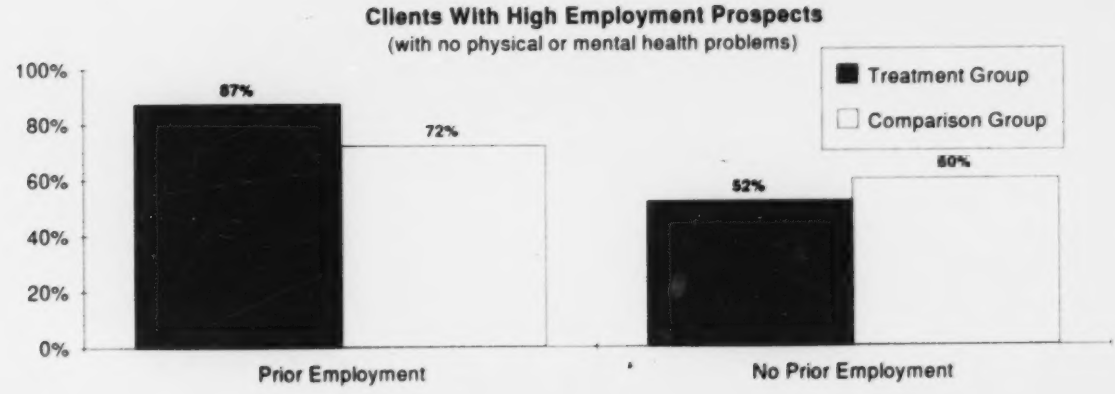
After Treatment

Among Clients With and Without Prior Employment

(Adjusted Rates between Treatment and Comparison Group in the 18 Month Follow-Up Period)*







* Rates have been statistically adjusted for differences in client characteristics between treatment and comparison groups. The adjustment was made for the following significant factors affecting probability of any employment in the follow-up period: physical problems and mental health problems.
For statistical details see the results of the logistic regression in Figure 1 in Appendix 2.

Section 3: Clients Achieving Substantive-Continuous Employment After Treatment

Treatment and Overall Levels of Substantive-Continuous Employment

Overall, treated clients have higher levels of substantive-continuous employment after treatment. Even after these levels were adjusted for differences in background characteristics, the clients in the Treatment Group were significantly more likely to be substantively-continuously employed than clients in the Comparison Group in the 18 month follow-up period.

Different Outcomes for Different Groups

The overall results hide important outcome differences among different groups of clients. All men, and women under 30, have better outcomes if treated. Women 30 or older do not.

Treatment Group clients had rates of substantive-continuous employment that were about three times higher than those for Comparison Group clients (19% versus 6%) among all men and among women less than 30. These clients represent 82 percent of all regular ADATSA clients.

Although these clients all had the same favorable treatment outcomes, the level of substantive-continuous employment they reached differed due to their different starting points. Increases were:

from 16 to 31 percent among men less than 30,

from 7 to 17 percent among women less than 30, and

from 3 to 13 percent among men 30 or older.

The results for the small group of women 30 years or older were opposite from those for other clients. Women 30 and older in the Comparison Group had an unexpectedly high rate of substantive-continuous employment. A large proportion of these women had mental problems and also had a high rate of substantive-continuous employment. This sample may not be representative of similar clients in the larger population. Further research with a larger sample is needed to test the validity of this inconsistent result. (See the more detailed discussion in Appendix 2.)

Other Factors Related to Substantive-Continuous Employment

Irrespective of age and gender, clients having the following characteristics are much more likely to be employed:

- **prior employment in the 12 months prior to treatment,**
- **and a combination of more than a high school education with no mental health problems.**

For example, among treated younger men, 68 percent of those having these prior characteristics were substantively-continuously employed compared to 15 percent for those not having these characteristics.

Figure 3

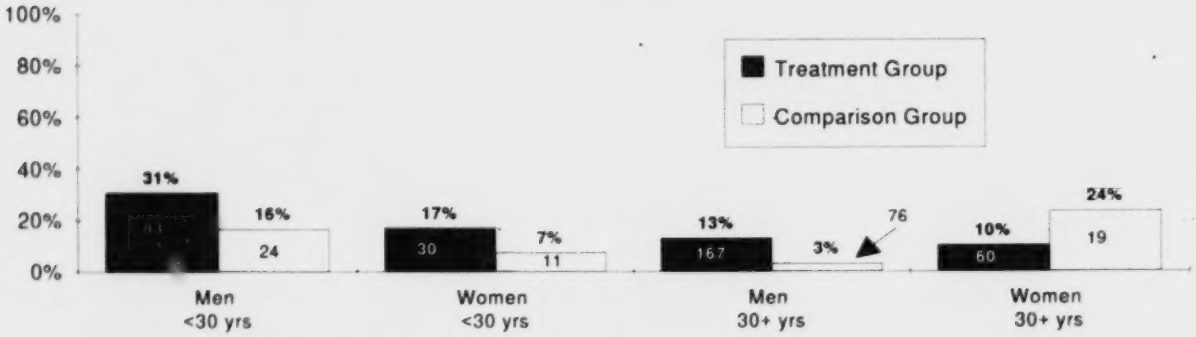
RATES OF ACHIEVING SUBSTANTIVE-CONTINUOUS EMPLOYMENT

After Treatment

Among Clients in Four Age/Gender Combinations

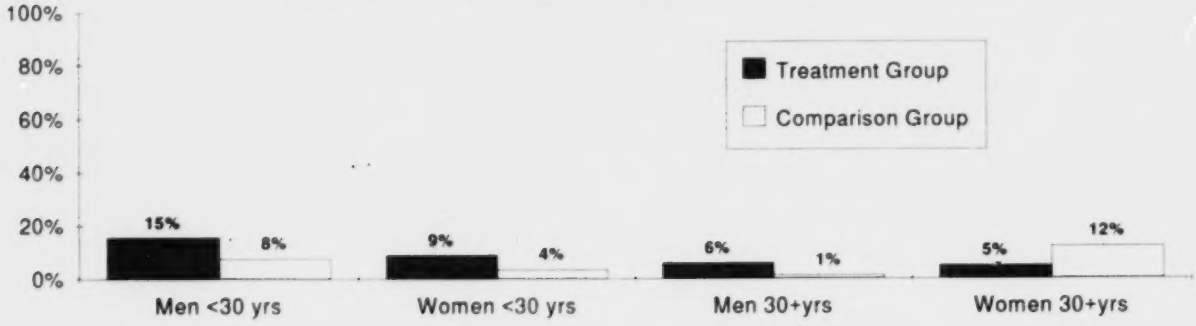
(Adjusted Rates between Treatment and Comparison Groups in the 18-Month Follow-Up Period)*

All Clients



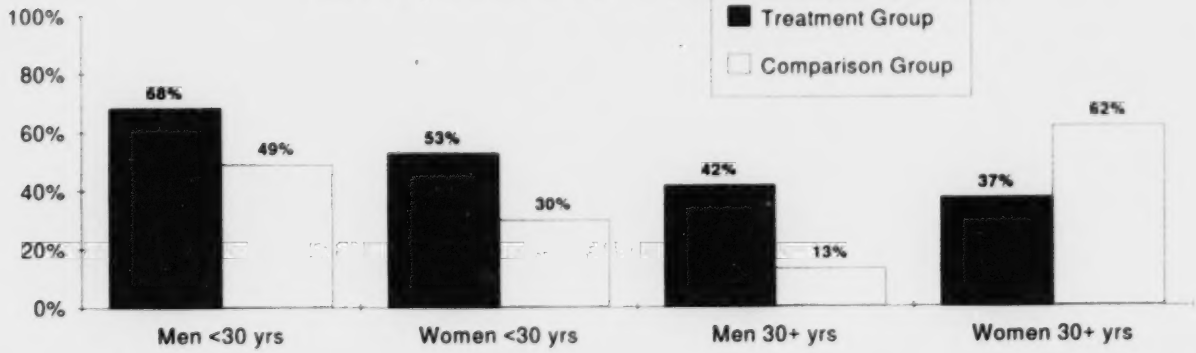
Clients With Low Employment Prospects

(no prior wages, no post-high school education, mental health problems)



Clients With High Employment Prospects

(prior wages, post-high school education, no mental health problems)



* Rates have been statistically adjusted for differences in client characteristics between Treatment and Comparison Groups within each age/gender combination. The adjustment was made for the following significant factors affecting probability of substantive-continuous employment in the follow-up period: earnings in the 12 months prior to assessment, education level and mental health problems.
For statistical details see the results of the logistic regression in Figure 2 in Appendix 2.

Section 4: Clients Average Earnings After Treatment

Average Earnings

Overall, most clients who complete all treatment have higher average earnings after treatment than clients in the Comparison Group. This overall result was statistically significant for most clients even after controlling for differences in client background characteristics between Treatment and Comparison Groups. The exception was the small group of Treatment Group women age 30 or over who earned significantly less than equivalent Comparison Group women.

Earnings Among Substantively-Continuously Employed

Since average earnings included the zero earnings of the unemployed and the limited earnings of those only partially and temporarily employed, we wondered whether earnings were higher for treatment completers substantively-continuously employed. We excluded women 30 and older in the calculations.*

Average Monthly Earnings of Clients Substantively-Continuously Employed, Among All Men and Among Women under 30, After Completing All, Some or No Treatment
(Non Adjusted Earnings)

	Completing All Treatment	Some But Not All Treatment	No Treatment (Comparison Group)
Average Monthly Earnings	$1,049 (n=29)	$854 (n=39)	$593 (n=10)

Among persons substantively-continuously employed, we found that earnings were higher for treated clients and particularly for those completing all treatment. Those who completed all treatment earned $1,049 per month. Those who obtained only some treatment earned $854. Comparison Group clients earned $593. These averages are non-adjusted, and the differences in earnings are not tested for statistical significance due to the small number of cases. Of interest is the trend to higher earnings for treatment completers, and the relatively high 'living wage' obtained by these clients.

Other Factors Leading to High and Low Prospects for Higher Earnings

Three background factors define high prospect clients in terms of post-treatment earnings:

having some earnings in the 12 months before treatment,

education beyond the high school level, and

no mental health problems.

Predicted average earnings after treatment more than doubled for clients with all the above characteristics compared to those for clients without these characteristics.

*Note: Among women 30 and older, average monthly earnings were about $750 regardless of treatment or treatment completion.

Figure 4

AVERAGE MONTHLY EARNINGS

Of Clients in Four Age/Gender Combinations

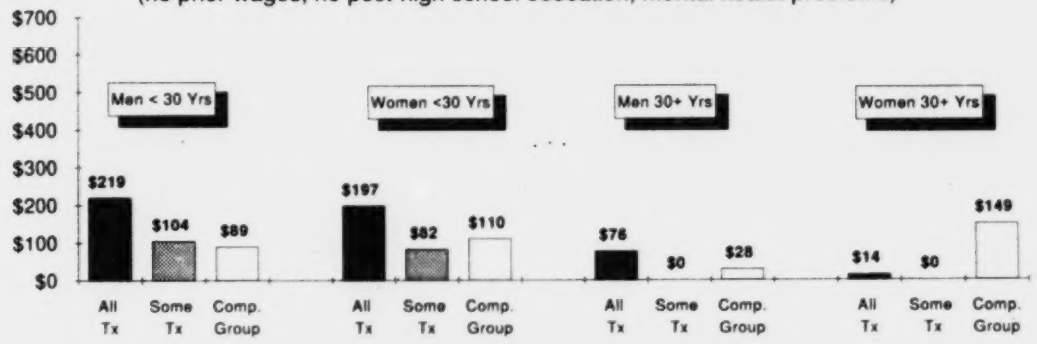
After Completing All or Some Treatment

(Adjusted Earnings in the 18 Month Follow-Up Period Among Clients Completing All Treatment, Some Treatment and Those in the Comparison Group)*

All Clients

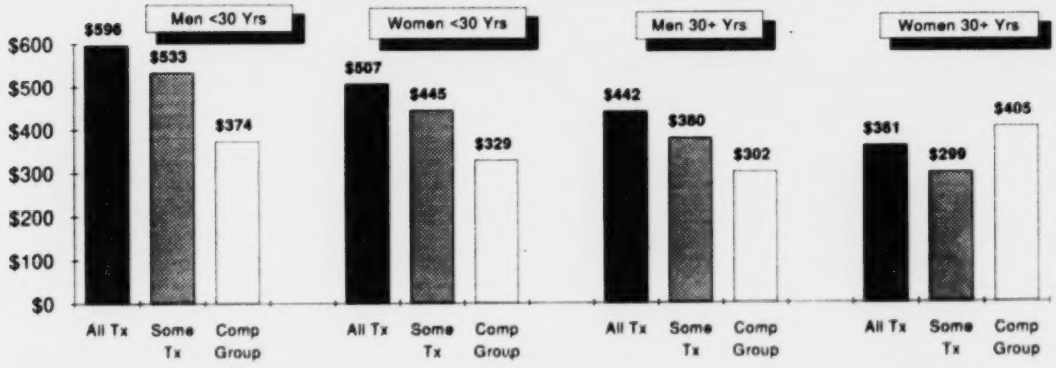
Clients With Low Employment Prospects

(no prior wages, no post-high school education, mental health problems)



Clients With High Employment Prospects

(prior wages, post-high school education, no mental health problems)



* Rates have been statistically adjusted for differences in characteristics among clients who obtained some treatment, all treatment and clients in the Comparison Group within each age/gender combination. The adjustment was made for the following significant factors affecting earnings in the follow-up period: earnings in the 12 months prior to assessment, education level and mental health problems. For statistical details see the results of the least squares regression in Figure 3 in Appendix 3.

Summary and Discussion

Overall Employment Outcomes

Overall, treatment led to higher rates of substantive-continuous employment and earnings for most regular ADATSA clients (82 percent of all clients). These results held true after we adjusted for differences in background characteristics between the Treatment Group and the Comparison Group. The exception was the small group of women age 30 or over.

Implications and Cautions

These major findings reflect positively on the effectiveness of the ADATSA treatment program as a whole.

Unmeasured Factors

One should interpret these findings with some caution since they are not based on a controlled experimental design with random assignment of clients to a Treatment and Control Group. Nevertheless, the control procedures utilized and the internal consistency of findings provide grounds for confidence in attributing differences in outcomes to treatment effectiveness, instead of to the effects of possible unmeasured factors.

Motivation Factors

It could also be argued that the apparent effectiveness of treatment may be due to the stronger motivation to change among clients who showed up for treatment after assessment compared to those who didn't. However both Treatment and Comparison Group clients sought treatment at the time of assessment. Motivational factors were not measured and their role remains unknown.

Employment Outcomes Among Subgroups

Specific employment outcome results among some groups of ADATSA clients give rise to concerns.

Prior Work Experience

- **Treated clients with no prior work experience had no higher likelihood of obtaining any kind of job after ADATSA treatment than those in the Comparison Group.**
- **Treated clients with no prior work experience had lower chances of achieving substantive employment and had lower earnings than other treated clients who had prior work experience.**

Age and Gender

- **Older clients and women, particularly those with no prior work experience, were found to have lower rates of substantive employment and earnings than younger men even if they obtained ADATSA treatment.**

In other words, lack of prior employment is the most important barrier to obtaining employment after treatment. Older age and being a woman are also barriers to employment. It appears that treatment is either unable to overcome these barriers or is only partially able to do so.

These findings suggest that there may be a need for more intensive and longer vocational training during treatment for clients with these barriers in order to improve their chances of employment.

The success of extra vocational services in improving all aspects of employment outcomes, presented in Chapter 3, adds weight to the above line of argument. Providing wider access to extra vocational services during or after treatment may help more clients overcome barriers to employment.

It could also be argued that different treatments are needed, matched to the characteristics of particular clients. For example, programs designed to meet the special needs of women may be advisable.

Mental Health Problems

We identified another group of clients who had low employment prospects in general and for whom treatment did not lead to improved chances of employment.

- **Treated clients with mental health problems had lower rates of employment and earnings after ADATSA treatment compared to treated clients without mental health problems.***

The importance of the mental health factor in employment outcomes of treatment suggests

- the existence of extra obstacles to employment among these clients (beyond those of addiction, lack of prior work experience, older age and being a woman),

and/or

- the need to offer this group of clients longer treatment programs more attuned to their needs.

The very limited availability of such programs—referred to commonly as "dual diagnosis" or Mentally Impaired/Chemically Addicted (MICA) programs—in the array of ADATSA treatment modalities was highlighted in the previous ADATSA report (see Longhi et. al., 1991: 45-52).

Chapters 4, 5 and 6 will present evidence on the much higher post treatment costs incurred by many publicly funded service programs for clients with mental health problems. This evidence adds a potential cost avoidance justification for expanding these dual diagnosis programs. The untested assumption is that these more appropriate pro-

*NOTE: Clients were identified as having "mental health problems" by chemical dependency counselors at assessment. The percentages identified in this way among regular clients (26 percent) is similar to that of clients identified in the National Hospital Discharge Survey (NHDS): 24 percent among both alcohol and drug abusers (Rice et al., 1990: Table 16).

grams would not only lead to better employment outcomes, but would also have cost avoidance effects. This may be probable, but further research is needed to test this assumption.

Combined Effects of Background Characteristics: High and Low Prospect Clients

Finally, we need to note that some clients enter ADATSA treatment already having high prospects for employment.

- **Employment rates and/or earnings are highest for clients with the following characteristics: prior work experience, no mental health problems or physical problems, better education, younger age and male.**

Conversely some clients have very low prospects for employment.

- **The most influential factor on all aspects of employment is lack of prior work experience, followed by having mental health problems.**
- **Having physical problems seems to be a barrier to "any employment".**
- **Being older, female, or less educated seem to impede obtaining substantive-continuous employment and higher wages.**

General Implications of Subgroup Findings

The results suggest the usefulness of developing a targeted strategy which provides treatment and vocational service programs attuned to needs of different subgroups.

EMPLOYMENT OUTCOMES FOR CLIENTS RECEIVING EXTRA VOCATIONAL SERVICES

3

Three pilot programs were established to provide brief and intensive extra vocational training to supplement the ADATSA program. This chapter compares post-treatment employment of ADATSA clients who participated in these three vocational programs to that of ADATSA clients who did not participate. In addition, employment outcomes for two groups of clients who participated in the vocational training are compared: those who completed all of the training and those who completed only part of the training.

The regular ADATSA program includes some preparation for employment. However, this preparation was not considered sufficient by a panel of qualified professionals assessing the most appropriate treatment for ADATSA clients. They recommended more vocational development as the most critical additional service needed in the reintegration phase of treatment and as the second most needed service, after housing, in the aftercare phase (Longhi, et. al., 91: 40-42). This chapter addresses the question of whether additional vocational services provided by three pilot programs were effective in improving client employment.

The different sub-groups are compared on three aspects of employment in the 18 months after treatment: 1) any employment at all, 2) substantive-continuous employment, and 3) average earnings. Substantive-continuous employment is defined in Chapter 2 as: employment with average earnings above the General Assistance-Unemployable (GAU) monthly grant ($314-$339) for at least 12 continuous months of the total 18 month follow-up period and still substantively employed in the last quarter of the period.

THE THREE PILOT VOCATIONAL TRAINING PROGRAMS

Rapid Rehabilitation Resolution (RRR)

Rapid Rehabilitation Resolution (RRR) is located in Spokane. This program administers services of the Division of Vocational Rehabilitation, excluding long-term training. Clients are referred by chemical dependency treatment counselors while still receiving care. If eligible for Vocational Rehabilitation services, they receive aptitude testing, vocational counseling and guidance, access to job listings, etc. They may receive short-term training such as re-certification. If, however, a client needs longer training, he/she is referred to a different Vocational Rehabilitation counselor. Services are provided *rapidly*, in less than three months, while the client is still in chemical dependency treatment and covered by ADATSA. No extra services or client stipend extensions are provided. Ninety-two RRR clients were studied.

ADATSA Cooperative Employment Program (ACEP)

ADATSA Cooperative Employment Program (ACEP) is located in Seattle. Clients begin the program after finishing chemical dependency treatment. Selection is made by an ADATSA counselor at, or near, the end of that treatment. Clients usually receive a two-month extension of ADATSA coverage and then complete the vocational rehabilitation program in that period. The program includes a motivational workshop with other recovering clients, which (in nine 90-minute sessions) covers asset identification and job-seeking skills. Division of Vocational Rehabilitation services (excluding long-term training) are provided. One hundred-three ACEP clients were studied.

Vocational Opportunity Training/ Education (VOTE)

The Vocational Opportunity Training/Education Program (VOTE) is located on the campus of Pierce College in Tacoma. VOTE is a 6-week intensive program (3 days a week, 6 hours a day) that provides job-seeking skills in the context of support for the recovering addict. The program has a high staff/client ratio and provides a wide variety of services, from character/aptitude assessment, through all job-seeking skills. It has links with the Department of Employment Security, and has access to other services on the college campus. Clients receive intensive job-seeking skills training, along with significant support and counseling about chemical dependency recovery. This six-week long program is funded by DASA. A total of 312 VOTE clients were studied.

Three Pilot and One No Extra Training Group

Data were collected for all clients who received services from the above programs, VOTE, ACEP and RRR. However, only those who ended their training between September 1, 1989 and June 30, 1990 were included in this study. This is the same time period in which the regular ADATSA clients, who had not received further vocational services, were finishing ADATSA treatment. We restricted the No Extra Training Group to a subset of regular ADATSA clients who had received treatment and resided in the six counties proximate to the pilot programs. This meant that the clients in the three pilot groups and the no training group were entering the same job markets at approximately the same time.

(See the discussion of detailed methods employed in client selection, and data sources in Appendix 3.)

Pre-training Differences in Client Characteristics

Clients receiving extra vocational training may have been quite different from clients not receiving the training due to the ways in which they were selected. Program clients were selected by staff from among all clients according to individual program policy and client personal choice. This could be expected to result in pre-training differences between the two groups (e.g., differences in prior work experience or education). Such differences could be expected to result in variations in post-training employment, independent of the effects of extra training. Therefore, in order to find out if vocational training itself increased employment, it was essential to control for relevant pre-training differences.

Data were available for all extra vocational training clients on a total of seven pre-training characteristics which were relevant to post-training employment: gender, age, education level, ethnicity, marital status, prior employment, and prior wages. All seven were entered as control variables in the data analysis. See Figures 4, 5, and 6 in Appendix 3 for bivariate results and Figures 1, 2, and 3 in Appendix 3 for multivariate results. This was done in order to test for the independent effect of vocational training on employment regardless of pre-training differences.

The question may arise as to whether these seven client characteristics were adequate to control for pre-training differences. In contrast to these seven, fifty characteristics were available for the analysis of the effects of regular ADATSA treatment on employment presented in Chapter 2. However, only six of those fifty had a significant, independent effect on post-treatment employment in that chapter's analysis. Fortunately, four of those six characteristics were also present among the seven available for the extra vocational training analysis: gender, age, education level and prior employment. The two missing characteristics were "physical problems" and "mental health problems". The latter characteristics had an important but relatively smaller influence compared to gender, age and prior employment experience because of the smaller proportion of clients involved. Therefore even though the seven variables are not an optimum set, they are an adequate set of controls to justify the statistical analysis.

ANY EMPLOYMENT AT ALL AFTER VOCATIONAL TRAINING

All Clients

The extra vocational training provided by all pilot programs appears to result in a substantial improvement in getting clients started with some employment.

The VOTE, ACEP, and RRR groups, with little difference in employment rates among them, each had a significantly higher rate of obtaining "any employment at all" than the No Extra Training group. ("Any employment" includes employment for any time at all, at any wage level, during the 18 month follow-up period.)

Low Prospect Clients

Among low prospect clients (clients with no employment during the year before treatment), extra vocational training appears to double the rate of getting started with some employment after treatment.

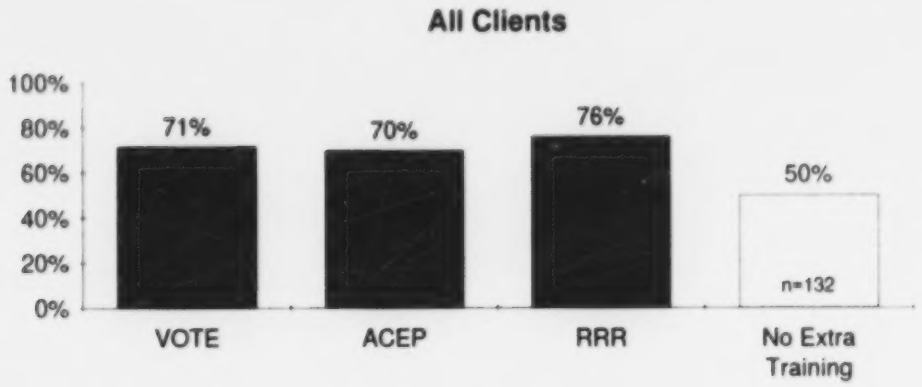
Statistical projections indicate the following rate differences among low prospect clients: about 44% employment rate for the three pilot vocational programs, compared to 23% for the No Extra Training Group.

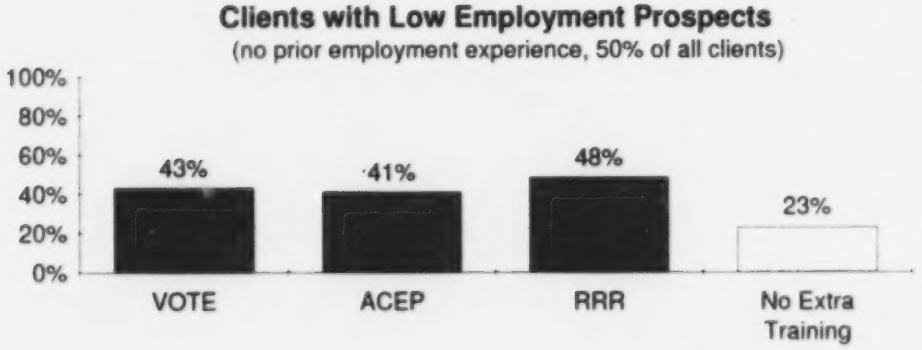
Among High Prospect Clients

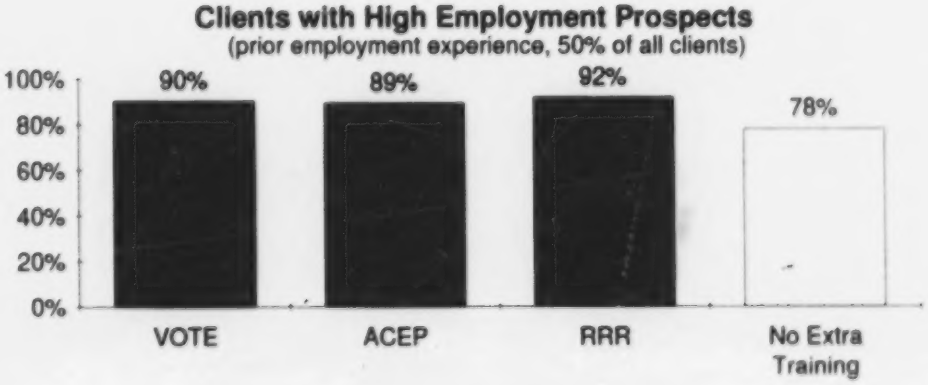
Almost all high prospect clients (those with some employment in the year before treatment) had some employment after they received extra vocational training.

Among these clients, employment rates were projected to be about 90% for those receiving extra vocational training compared to 78% for those with no extra training.

Figure 1
RATES OF ACHIEVING ANY EMPLOYMENT AT ALL
After Extra Vocational Training in Three Pilot Programs
(Adjusted Rates Among Three Pilot Programs and the No Extra Training Group in the 18 Month Follow-Up Period)*







* Rates have been statistically adjusted for differences in prior employment experience among Pilot Program Groups and the No Extra Training Group.
For statistical details see the results of the logistic regression in Figure 1 in Appendix 3.

SUBSTANTIVE-CONTINUOUS EMPLOYMENT AFTER VOCATIONAL TRAINING

Overall Levels Among Completers

Completing vocational training has positive outcomes in terms of the clients' substantive-continuous employment.

In the three vocational training programs (VOTE, ACEP, and RRR), completers had a significantly higher rate of obtaining substantive-continuous employment than both non-completers and clients in the No Extra Training group: 26 percent for completers versus 11 percent for non-completers and 16 percent for the No Extra Training group.

Note that the exceptionally high rate of substantive-continuous employment among ACEP completers is probably due to the rather extreme selectivity in this program. A very small proportion of clients is defined as completers in the ACEP group.

Non-Completers

While completing part of an extra vocational training program is enough to increase the rate of getting started with some employment, in order to increase the rate of substantive-continuous employment it is necessary to *complete* the vocational training.

There was no significant difference in rates of substantive-continuous employment between non-completers in three vocational training programs and clients in the No Extra Training group.

Low and High Prospect Clients

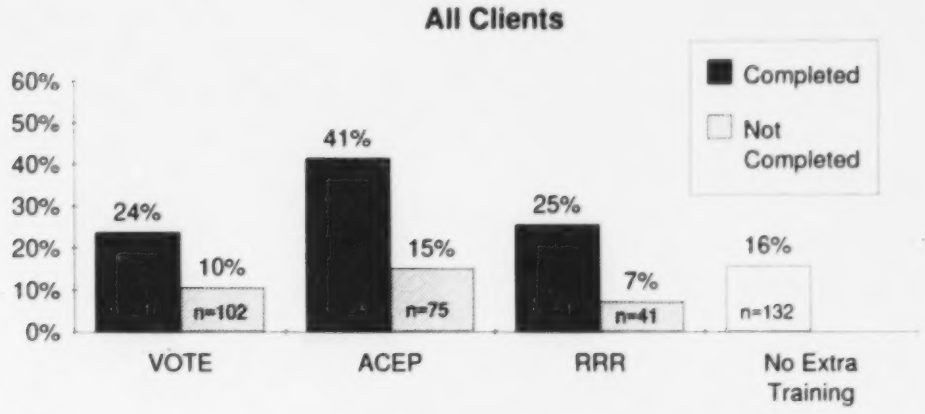
Being high prospect (i.e. having some employment in the year before treatment) appears to make a big difference in the likelihood of obtaining substantive-continuous employment after training.

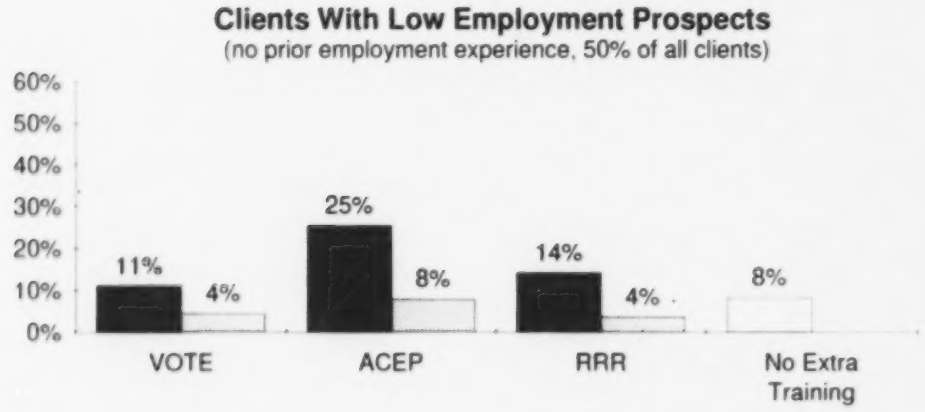
Among high prospect clients, about 50 percent of the persons completing vocational training were projected to have substantive-continuous employment compared to 25 percent in the No-Extra Training Group—an impressive achievement for addicted clients who were indigent and unemployable at the time of assessment.

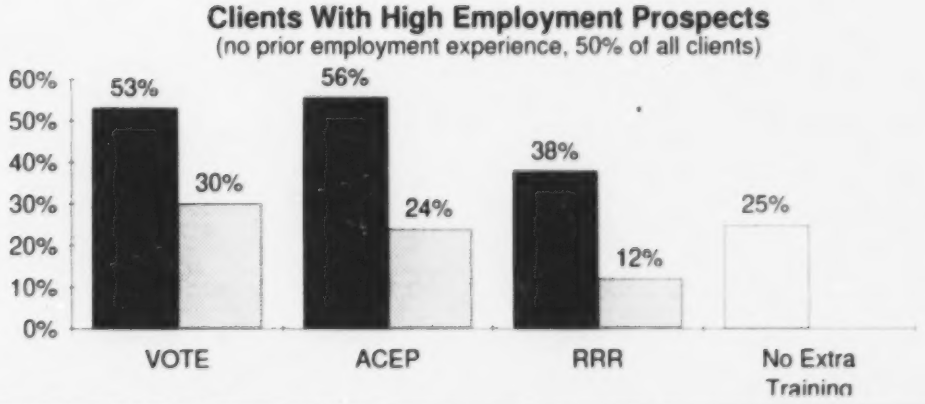
Projected rates of substantive-continuous employment for clients with low prospects of employment were relatively low for all groups; nevertheless, those completing extra vocational training had about three times the employment rates of those not completing the training.

Note: Differences in employment rates among the three vocational training programs must be treated cautiously due to labor market differences in the areas served as well as differences in program completion rates; however, these limitations are not likely to affect the overall pattern of differences between clients receiving extra vocational training and clients not receiving that training.

Figure 2
RATES OF ACHIEVING SUBSTANTIVE-CONTINUOUS EMPLOYMENT
After Completing All or Some Extra Vocational Training in Three Pilot Programs
(Adjusted Rates Among Three Pilot Program Groups by Completion Status and the No Extra Training Group in the 18-Month Follow-Up Period)*







* Rates have been statistically adjusted for differences in prior employment experience and gender composition among Pilot Program Completers, Non-Completers and the No Extra Training Group.
For statistical details see the results of the logistic regression in Figure 2 in appendix 3.

AVERAGE CLIENT EARNINGS AFTER VOCATIONAL TRAINING

Completers

Completing all of the extra training appears to double average earnings over the 12 month period.

Clients in VOTE, ACEP, and RRR who completed extra vocational training earned significantly more than non-completers and clients in the No Extra Training Group. Note that the unusually high earnings among ACEP completers are probably due to the fact that only 27% of the clients completed the program, making them a highly selective subgroup.

Non Completers

Incomplete vocational training does not appear to affect earnings.

Non-completers in the Extra Vocational Training groups had earnings which were not significantly different from the No Extra Training group.

Among High and Low Prospect Clients

Completing extra training tends to increase earnings by the same amount for both high and low prospect clients.

High and low prospect clients are those with and without, respectively, prior earnings the year before treatment.

Clients who completed training, whether low or high prospect, were projected by the statistical model to earn substantially more than clients not completing training or not getting training. The differences in earning were estimated to be similar.

Among Men and Women

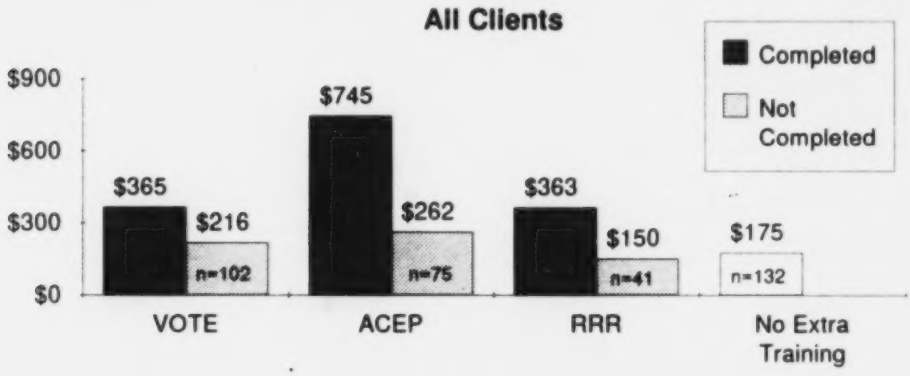
While women obtain jobs at a similar rate to men after completing extra training, those jobs tend to pay less.

Post-extra training earnings were projected to be substantially lower for women than for men in all groups, including high and low prospect clients as well as those receiving and those not receiving extra vocational training.

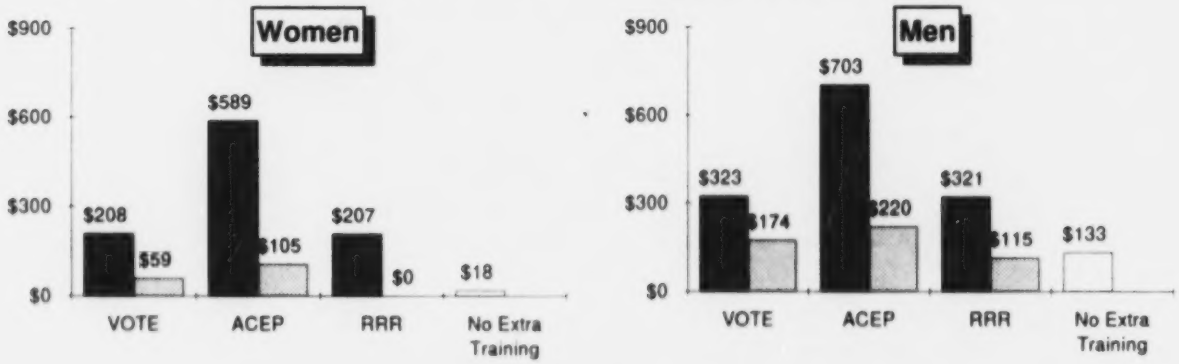
This occurred despite the fact that women did not have lower rates of substantive employment than men.

Note: Average monthly earnings calculations in the analysis encompassed all clients, including those with zero earnings, and this makes the averages lower than might be expected. The differences in earnings result from differences in job entry, in continuity of employment and in the monthly wage rate.

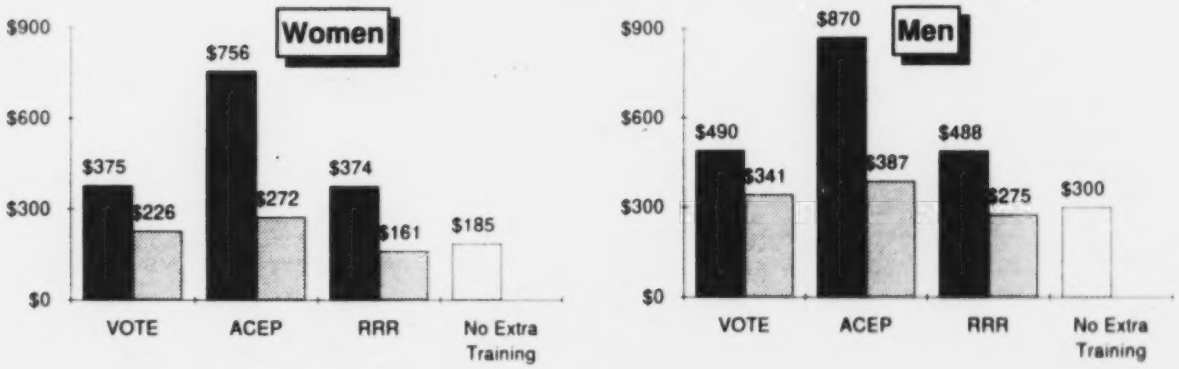
Figure 3
AVERAGE MONTHLY EARNINGS
After Completing All or Some Extra Vocational Training in Three Pilot Programs
(Adjusted Earnings Among Three Pilot Program Groups and the No Extra Training Group in the 18-Month Follow-Up Period)*



Clients with Low Earnings Prospects
(no prior earnings, 60% of all women clients; 46% of all men clients)



Clients with High Earnings Prospects
(prior earnings, 40% of all women clients: 54% of all men clients)



* Earnings have been statistically adjusted for differences in prior monthly earnings and gender composition among Pilot Program Completers, Non-Completers and the No Extra Training Group.
For statistical details see the result of the least squares regression in Figure 3 in Appendix A.7

CLIENT BACKGROUND CHARACTERISTICS WHICH DID OR DID NOT AFFECT POST TRAINING EMPLOYMENT AND EARNINGS

We should recall that data were available on a total of seven pre-training characteristics which were relevant to post-training employment: gender, age, education level, ethnicity, marital status, prior employment, and prior earnings.

Post-Training Employment

The major finding is that prior employment was the only one of the seven available client characteristics which was related to an increased likelihood of obtaining any or substantive-continuous employment after training.

It is important to note that the three other available client characteristics which *were* related to higher employment after ADATSA treatment alone—namely age, gender and education—were *not* related to employment after extra vocational training was provided. **That is, extra vocational training appears to have compensated for employment limitations related to being older, female or not having a post high school education.**

Post Training Earnings

Considering client's earnings in the 18 month follow-up period, both gender and pre-treatment earnings were found to have independent, statistically significant effects. Women were paid less than men even though women had similar prior earnings and, based on the prior findings, even though women had similar chances of post training employment. **That is, having higher pre-treatment earnings increased the level of post-training earnings for all clients, but the increase was less for women than it was for men.**

Characteristics Having or Not Having Continued Effects

Overall, these results show the continued importance of prior employment and prior earnings for clients' chances of post-training employment and earnings, respectively, even after receiving vocational services. Having or not having these characteristics defines high and low prospect clients for extra vocational services. These factors, we should remember, were also found to affect employment outcomes after ADATSA treatment.

Surprisingly, other prior factors notably age, education, and gender, (with the exception of gender's effect on earnings), do <u>not</u> affect post-training employment significantly. These factors did significantly affect employment after ADATSA treatment.

SUMMARY AND DISCUSSION

Summary

The employment outcomes after extra vocational training are statistically significant and they are relatively large compared to the outcomes for ADATSA treatment alone:

- **The pilot programs seem to be much more successful than ADATSA treatment alone in getting clients started in a job, even for clients with low employment prospects;**
- **Higher chances of substantive-continuous employment depend upon completing the training programs: completers are about twice as likely as non-completers to achieve this level of employment;**
- **The above results are true regardless of age, gender and education level: this was not the case among clients receiving only ADATSA treatment, among whom being women, older and less educated decreased significantly the chances of substantive employment;**
- **The findings on average earnings are consistent with the above results except for the case of women: women are paid less even though they have similar rates of substantive employment to those for men.**

Conclusion

On the whole, the pilot vocational training programs seem to help clients obtain employment beyond the effects of chemical dependency treatment alone. They appear to be able to overcome obstacles to employment due to age, education and also, at least partially, obstacles due to gender. To a limited extent these programs are successful with clients with no prior employment experience.

Policy Implications

ADATSA clients tend to have poor job skills and to have life styles which are not conducive to obtaining and maintaining employment. Under these circumstances, it is somewhat surprising that six to twelve weeks of training have the positive results that were found. Little actual skill training is possible in the brief time-frame and no longer term follow-up support is provided. This suggests that a carefully constructed, longer vocational training program with follow-up support might be even more effective for clients with little prior work experience. And, of course, these findings lend support to an extension of similar "fast track" programs to a larger proportion of ADATSA clients.

Caution The reader should remember that there was systematic selection in the assignment of clients to the extra training, and the statistical controls for results were limited to the seven available variables. Therefore, these results—however promising—are not definitive. Studies with experimental designs (random assignment of subjects to experimental and control groups) need to confirm these positive employment outcomes of pilot vocational programs.

CONTINUED RELIANCE ON INCOME AND MEDICAL ASSISTANCE AFTER TREATMENT

4

In this chapter we address the following question: Does ADATSA treatment reduce the continued use of, and costs for, income and medical assistance? To answer this question, post-treatment use and costs for three publicly funded programs were analyzed: income assistance, medical assistance and re-entry into substance abuse treatment.

Data from our primary sample of regular ADATSA clients, as in the employment analysis in Chapter 2, were used for this analysis. The rates of participation and costs for the ADATSA Treatment Group during the 12 months after treatment were compared to those for the Comparison Group during the 12 months after their assessment for ADATSA eligibility. It will be recalled that this Comparison Group became eligible but did not receive the particular ADATSA treatment offered and/or scheduled. Data were collected and reported for a 12 month follow-up period treatment rather than 18 months (as in the employment analysis) due to the unavailability of some publicly funded services cost information for this longer period at the time of this study.

In the analysis for each publicly funded services outcome, Treatment and Comparison Group differences were adjusted for each client characteristic which had an independent significant effect on the post-treatment use of publicly funded services in the follow-up period. Please refer to detailed methods and statistical techniques described in Appendix 1.

EXPECTED PUBLICLY FUNDED SERVICES OUTCOMES

The General Expectation

ADATSA treatment is designed to reduce substance abuse and improve life skills. **The improved functioning which results from such treatment would ordinarily be expected to reduce client use of publicly funded services after treatment.**

However, the actual situation is somewhat more complex. **Continued or increased** use and costs are expected after ADATSA treatment for some clients in some programs some of the time.

Counter Expectations Regarding Income Assistance and Medical Services

Two reasons for expecting continued reliance on publicly funded services are relevant to this analysis: clients' needs for (1) other forms of assistance for which they may have become newly eligible, and (2) assistance for newly recognized persistent physical and mental health problems.

Community Services Gateway:

A large percentage of the ADATSA clients did not receive any publicly funded services in the year before entering the program. Whether they needed and met eligibility requirements for assistance or not, these clients were outside the welfare system. In order for them to be referred for an ADATSA assessment, these clients first had to go to a local Community Service Office (CSO) to establish their categorical eligibility for the program.

The process of establishing eligibility for ADATSA at the CSO also provided the occasion to establish eligibility for income and medical assistance programs. Therefore, having passed the CSO "gateway" into the publicly funded services system, many of these clients are expected to receive some needed services after their ADATSA assessment and/or treatment.

Any publicly funded services received by these "gateway" clients after treatment constitute an increase from their zero use before treatment. Therefore, **an *increased* rate of use of publicly funded services after treatment can be expected for "gateway" clients**. This expected increase results from clients passing through the CSO gateway - not from their receiving ADATSA treatment.

On the other hand, **among clients who receive some form of publicly funded benefits during the year before treatment ("non-gateway" clients), there is reason to expect a decrease in use after treatment**.

Physical And Mental Health Problems:

Some physical and mental health problems that cannot be dealt with adequately by the regular ADATSA program will be recognized by clients and program staff in the course of treatment. Staff may seek continued help for the client and/or the client may recognize the need to deal with these problems when (s)he becomes more functional as a result of program participation. In particular:

- **Physical Problems and Inpatient or Outpatient Medical Assistance**

  A long-term inability to obtain routine medical care due to the disabling effects of addiction can be expected to result in a build-up of needs. These "catch-up" needs may increase the use of medical care when the client is functioning better in the first months after treatment. **For clients who have been receiving effective treatment for addiction, these *increases* are most likely to be in *outpatient medical care.***

  On the other hand, for clients not receiving effective treatment for addiction or for those relapsing after treatment, the expectation is a greater use of expensive inpatient medical care. Such care is often needed due to destructive physical consequences directly attributable to the addiction, to unhealthy living situations, or to the violence present in the social setting of some addicts. **Treatment, if effective, should lead to *decreases* in these *inpatient medical costs.***

- **Mental Health Problems and Continued Income and Medical Assistance**

  Identification of a mental health problem (or better appreciation of its severity) in the course of ADATSA treatment is a common occurrence. The complications of a mental health problem can be expected to increase the difficulty of providing treatment for addiction. Under these conditions, the six month ADATSA treatment period will often be too short to deal adequately with the client's disabilities. **Mental health problem identification is likely to result in an increased use of income assistance during the follow-up period.** The General Assistance Unemployable Program, in fact, recognizes both mental and physical incapacities to work as criteria for eligibility.

  Since clients on income assistance are also eligible for medical assistance, their continued need for medications may also increase their medical expenses in the follow-up period. **To the extent that treatment may be too short and not the most appropriate for these clients, an increase in use of medical services is expected even after treatment.** Some clients with mental health problems may become eligible for further medical assistance by receiving income assistance. Some clients with mental health problems may continue receiving medical assistance by re-entering into chemical dependency treatment programs. (See Chapter 5 results on re-entry.)

INCOME ASSISTANCE RESULTS

Overall Similarity

Participation rates and costs for income assistance were very similar overall for Treatment and Comparison Groups in the 12 months after treatment.

	Participation	*Cost*
Treatment Group	**31%**	**$869**
Comparison Group	**29%**	**$801**

The participation rate is the percentage of clients who received welfare grant payments at any time during the 12 month follow-up period. The cost figure is the per client cost over the 12 months for all welfare payments received. The cost amount is sensitive not only to differences in participation but also to differences in the number of months in which welfare payments were received.

Subgroup Differences in Costs

Given the similarity in both participation rates and costs, we may be tempted to conclude that ADATSA treatment does not effect clients' reliance on income assistance programs. This is not true. The similarity is the net result of a complex set of differences in treatment effects, some positive some negative, for various sub-groups of clients.

The affect of treatment upon the amount of income assistance received in the follow-up period depended significantly on client status on each of several background characteristics. Those characteristics are: prior mental health status, age, prior treatment episodes, prior ADATSA assessments, and family history of mental illness. (See Appendix 4, Figure 1.) The effects of some of these characteristics are not readily interpretable from the available data. We focus on explaining the effects of age and prior mental health status because of their consistent affects on many treatment outcomes.

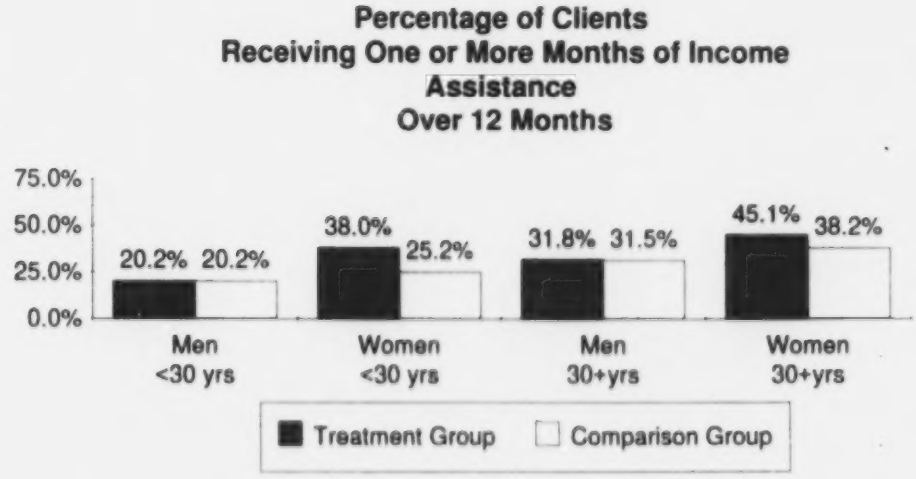
Age and Mental Health

- **Income assistance costs were *lower* for younger clients if treated, higher for older clients if treated. (See Figure 1, top panel.)**
- **Income assistance costs were higher for persons with mental health problems if treated. (See Figure 2, top panel.)**

Similarities in Participation

- **Surprisingly, the data showed that rates of participation were similar between Treatment and Comparison Groups for clients of different ages and mental health statuses. (See Figures 1 and 2, bottom panel)**
- **Treatment only affected income assistance participation rates among clients with high prior medical costs and this was only a trend (Significance level of .0592. See Appendix 4, Figure 2.)**

Figure 1
Income Assistance Outcomes
FOR CLIENTS IN FOUR AGE/GENDER COMBINATIONS
(Adjusted Results Between Treatment and Comparison Groups for the 12 Month Period)*

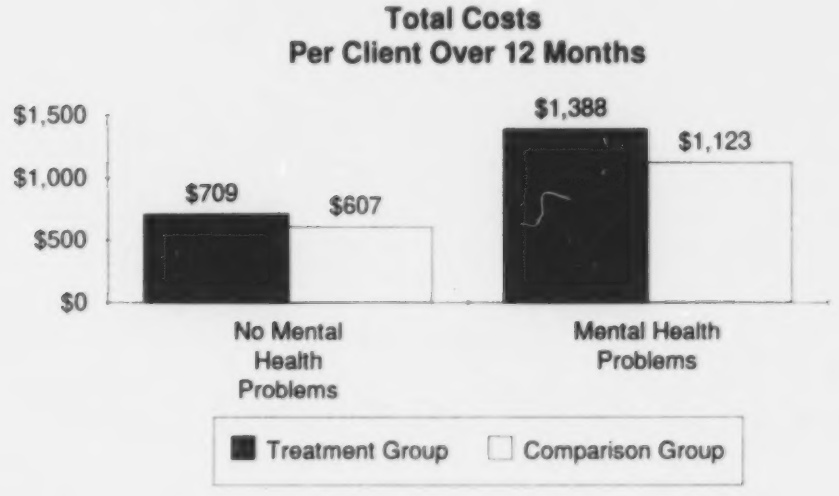


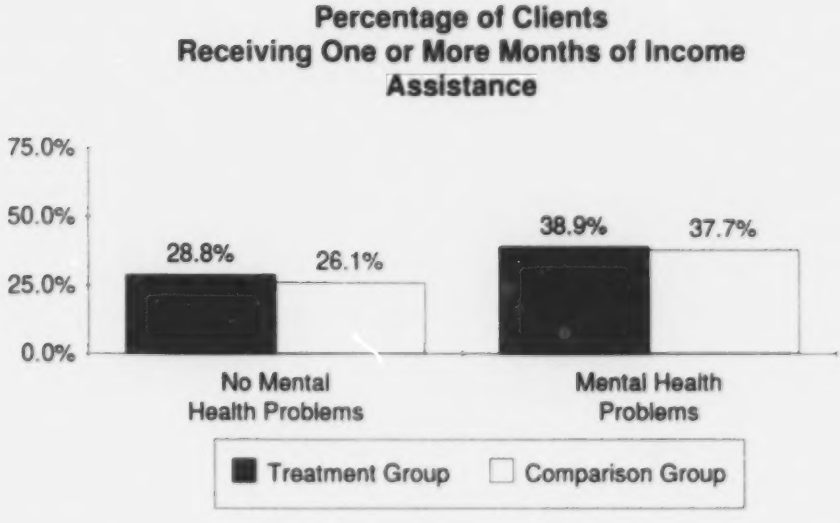
*Outcomes have been statistically adjusted for differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for the following significant factors affecting income assistance outcomes in the follow-up period:

- **for total per client costs over 12 months after treatment** - client age, mental health problems, family history of mental illness, prior ADATSA assessments, prior admissions to treatment and total income assistance costs 12 months before treatment;
- **for probability of receiving one or more months of income assistance over 12 months after treatment** - client gender, family history of mental illness, prior admissions to treatment, having a scheduled physical evaluation, evidence of one or more health problems, prior medical assistance and income assistance 12 months before treatment.

For statistical details see the results of the statistical models in Figures 1 and 2, Appendix 4.

Figure 2
Income Assistance Outcomes
FOR CLIENTS WITH AND WITHOUT MENTAL HEALTH PROBLEMS
(Adjusted Results Between the Treatment and Comparison Groups
in the 12-Month Follow-Up Period)*





* See note in Figure 1.

Discussion

The explanation for the incongruent findings between costs and participation for older clients and persons with mental health problems is that clients with these characteristics stay *longer on income assistance* and, therefore, their costs are higher.

Almost all ADATSA clients who receive income assistance receive it from the General Assistance - Unemployable (GA-U) program. Other ADATSA clients on Aid for Dependent Children (AFDC) and Social Security Insurance (SSI) programs have been excluded from this analysis and are discussed in Chapter 7. Longer eligibility for the GA-U program is contingent on proving continued incapacity to work due to physical/mental problems which have not been relieved by abstinence from addictive substances.

To the extent that ADATSA treatment cannot remedy pre-existing physical/mental problems, and to the extent that these tend to become more prevalent and severe with length of addiction and age, then ADATSA clients with these conditions may continue to stay longer on income assistance.

Conclusion

One possible conclusion from the above findings is that ADATSA treatment may relieve less severe physical and mental problems among younger clients. Thus, their improved functioning after treatment would lead to a briefer use of income assistance.

However, among older clients, these physical/mental health conditions may persist in spite of treatment, leading to continued eligibility and longer use of income assistance.

Policy Implications

This raises the question of whether ADATSA can offer appropriate treatment to Mentally Impaired and Chemically Addicted (MICA) clients given current funding constraints and the legislatively imposed limit of six months of treatment. This also raises the question of whether the virtual elimination of the shelter component of the ADATSA program may have been wise in light of continued proven physical/mental health incapacities among a substantial number of ADATSA clients.

The Further Complication of the Community Services Gateway

The procedures by which ADATSA clients enter the services system complicate the situation. As noted earlier, clients become potentially eligible for both ADATSA and other publicly funded programs by applying for help at the Community Services Office. Some persons who had no assistance before may now become eligible due to the documentation of physical/mental incapacities. They may 'cost' more after treatment than before treatment if these incapacities persist. *Therefore, it is important to know whether or not there is a decrease in income assistance use after treatment among non-gateway clients.*

To answer this question, an analysis was run which included only non-gateway clients; that is, ADATSA-treated clients who had already received publicly funded benefits in the year before treatment. The findings for clients already on publicly funded services before treatment are:

- **Overall, use of income assistance during the 12 months after treatment *decreased* slightly from before treatment for these clients, except for women age 30 or older.**
- **Use of income assistance *increased* substantially for clients who had mental health problems, *while it decreased* for clients without mental health problems.**

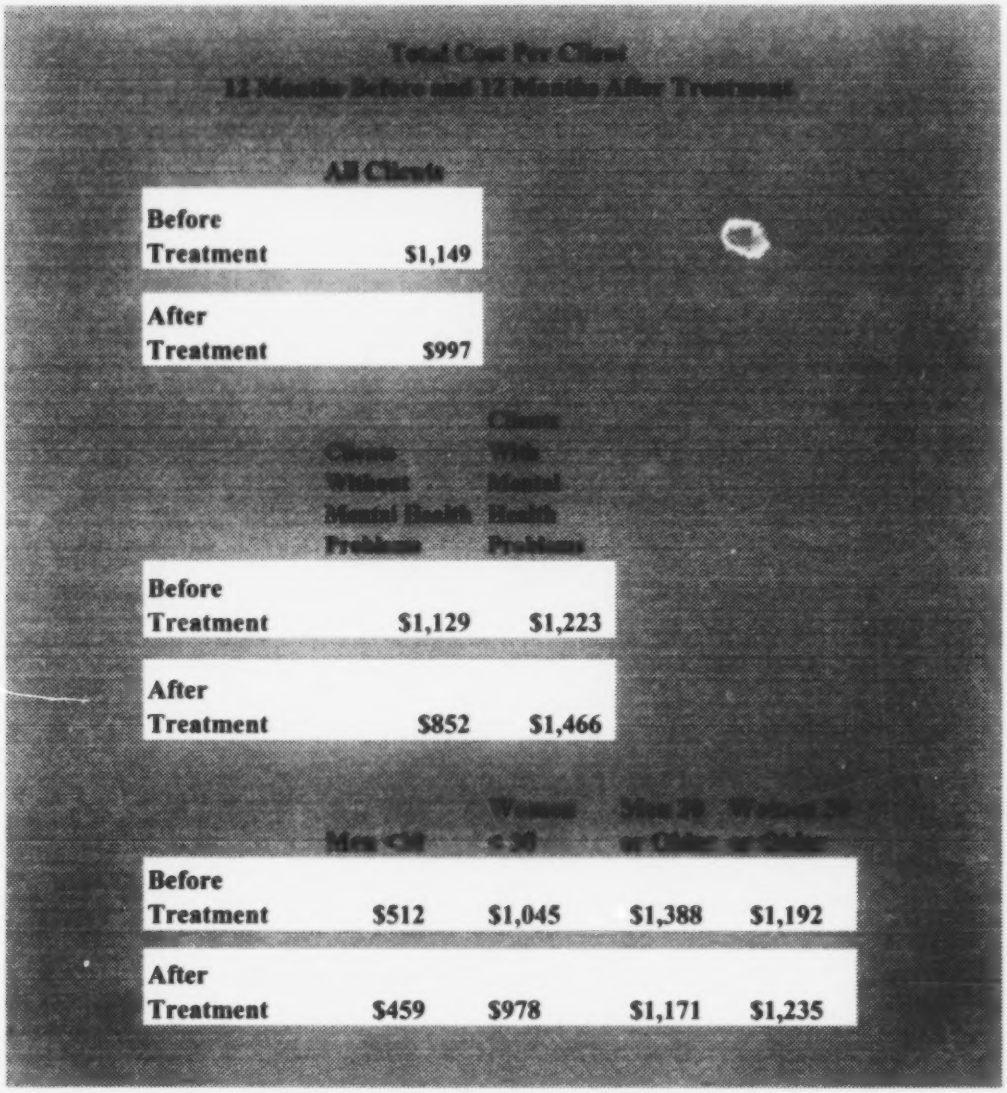
These are only suggestive trends, not rigorous statistical results. Costs before treatment were not adjusted and further study would be required to obtain definitive results.

Further Discussion and Implications

However tentative, the findings of generally lower income assistance costs from before to after, for most age-gender groups and particularly among clients without mental health problems, reflect positively on the efficacy of ADATSA treatment.

These preliminary results, based on an analysis of the costs of clients who were already on assistance before treatment, confirm the importance of considering the distinct needs of clients with mental health problems. The financial penalty for not addressing these needs is an increase in income assistance costs after treatment, to a level higher than those incurred before treatment.

Figure 3
COMPARISON OF INCOME ASSISTANCE COSTS
Before and After Treatment
For Treated Clients Who Were Receiving Publicly Funded Services Before Treatment
(After Treatment Costs Adjusted, Before Treatment Costs Unadjusted)


Total Cost Per Client
12 Months Before and 12 Months After Treatment
All Clients
Before Treatment $1,149
After Treatment $997
Clients Without Mental Health Problems
Clients With Mental Health Problems
Before Treatment $1,129 $1,223
After Treatment $852 $1,466
Men <30
Women <30
Men 30 or Older
Women 30 or Older
Before Treatment $512 $1,045 $1,388 $1,192
After Treatment $459 $978 $1,171 $1,235

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MEDICAL ASSISTANCE RESULTS

Total Medical Costs After Treatment

Total medical costs were somewhat lower in the follow-up period for clients who received treatment; however, there were major differences between inpatient and outpatient findings. **Inpatient costs were much lower for the Treatment Group than the Comparison Group, while outpatient costs were somewhat higher for the Treatment Group than the Comparison Group.**

MEDICAL COSTS

	Average Inpatient	Outpatient	Total
Treatment Group	**$310**	**$684**	**$ 994**
Comparison Group	**$686**	**$564**	**$ 1,250**

The cost figures are the adjusted average per client charges paid by Medicaid for medical expenses covered by this program over 12 months of the follow-up period. (See Figure 4.)

Participation rates were not calculated because they are not central to our analysis of medical costs.*

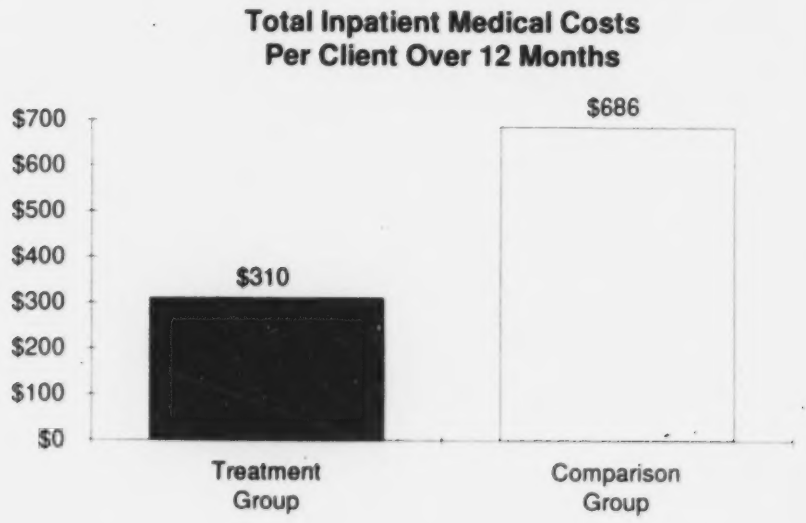
Inpatient Versus Outpatient Medical Costs

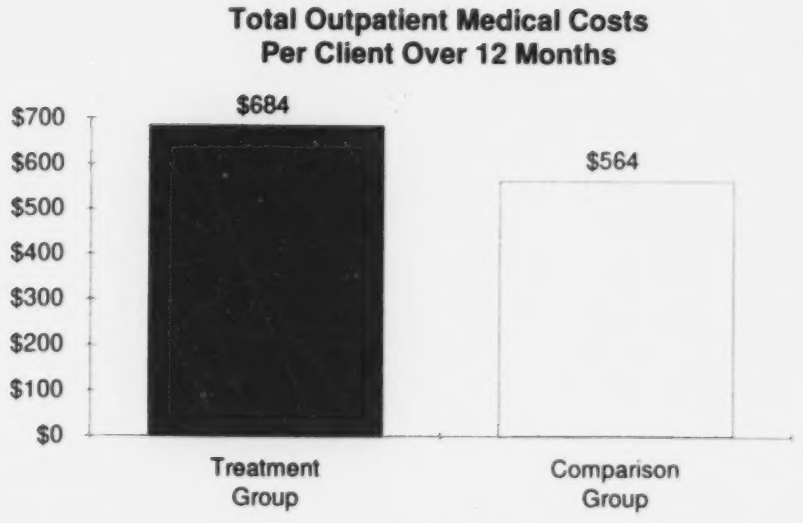
Before presenting more detail about inpatient and outpatient results, it is important to clarify their significance:

- **Inpatient medical costs** are usually incurred for more severe medical problems. In the case of chemically addicted persons, these may be related to the failure to adequately reduce addiction and its often destructive physical consequences.
- **Outpatient costs** (regular doctor visits, laboratory and medicine costs) are usually incurred for purposes of health maintenance. It may be argued that ADATSA clients have a build-up of health maintenance needs which may not be met within the short treatment period. (See clinical professionals' call for more medical health care services during treatment: Longhi et. al., 1991: 40-42.)

* Participation simply means being eligible for Medicaid which occurs automatically when clients become eligible for income assistance. (Some low-income clients become eligible for Medicaid without becoming eligible for income assistance.) It should be recalled from the previous section that we found no difference in overall income assistance participation rates. This means that the differences in medical costs reported here are unlikely to be a function of differences in participation rates.

Figure 4
Overall Medical Costs
BY INPATIENT AND OUTPATIENT SERVICES
(Adjusted Costs Between Treatment and Comparison Groups in the 12 Month Follow-Up Period)*





*Differences in client characteristics between Treatment and Comparison Groups have been statistically adjusted for the following significant factors:

- **for total per client costs of inpatient medical services -** client gender, ethnicity and prior use of inpatient medical services;
- **for total per client costs of outpatient medical services -** client being male less than 30, being pregnant at the time of assessment, having a family with a history of chemical dependency and prior use of outpatient medical services.

For statistical details see the results of the statistical models in Figures 3 and 4, Appendix 4.

Lower Inpatient Medical Costs

The much lower average inpatient medical costs reported above for clients who had received treatment are a result of the interaction effect of treatment with prior inpatient medical costs; i.e. **the higher the inpatient medical costs before treatment, the greater the inpatient medical cost avoidance associated with receiving treatment.** (See Figure 5.)

Cost avoidance is defined as the difference between the adjusted costs incurred by the Treatment Group and those incurred by the Comparison Group. (See the grey area in Figure 5). For example, the highly-significant statistical results displayed in Figure 5 predict the following inpatient medical cost avoidance for different treated clients.

- If cost before treatment were $100, cost avoidance associated with treatment would be expected to be about $80.
- If cost before treatment were $500, cost avoidance associated with treatment would be expected to be about $360.
- If cost before treatment were $1,000, cost avoidance associated with treatment would be expected to be about $705.

These lower inpatient medical costs for clients were found irrespective of age or mental health status, which is surprising given the fact that most of the other assessed outcomes were affected by these two characteristics. (See Figures 6 and 7, top panels.)

Women and whites incurred higher inpatient medical costs if treated, while men and minorities incurred lower inpatient medical costs if treated. (See Appendix 4, Figure 3 for the complete analysis related to inpatient medical costs.) Reasons for these differences could be ascertained only by a more detailed study than the present one; i.e. a study involving types of medical services and use patterns.

Similar Outpatient Medical Costs

The slightly higher outpatient medical costs during the follow-up period for clients receiving treatment, as reported earlier, are a balance between much higher costs for some client subgroups and much lower costs for other client subgroups.

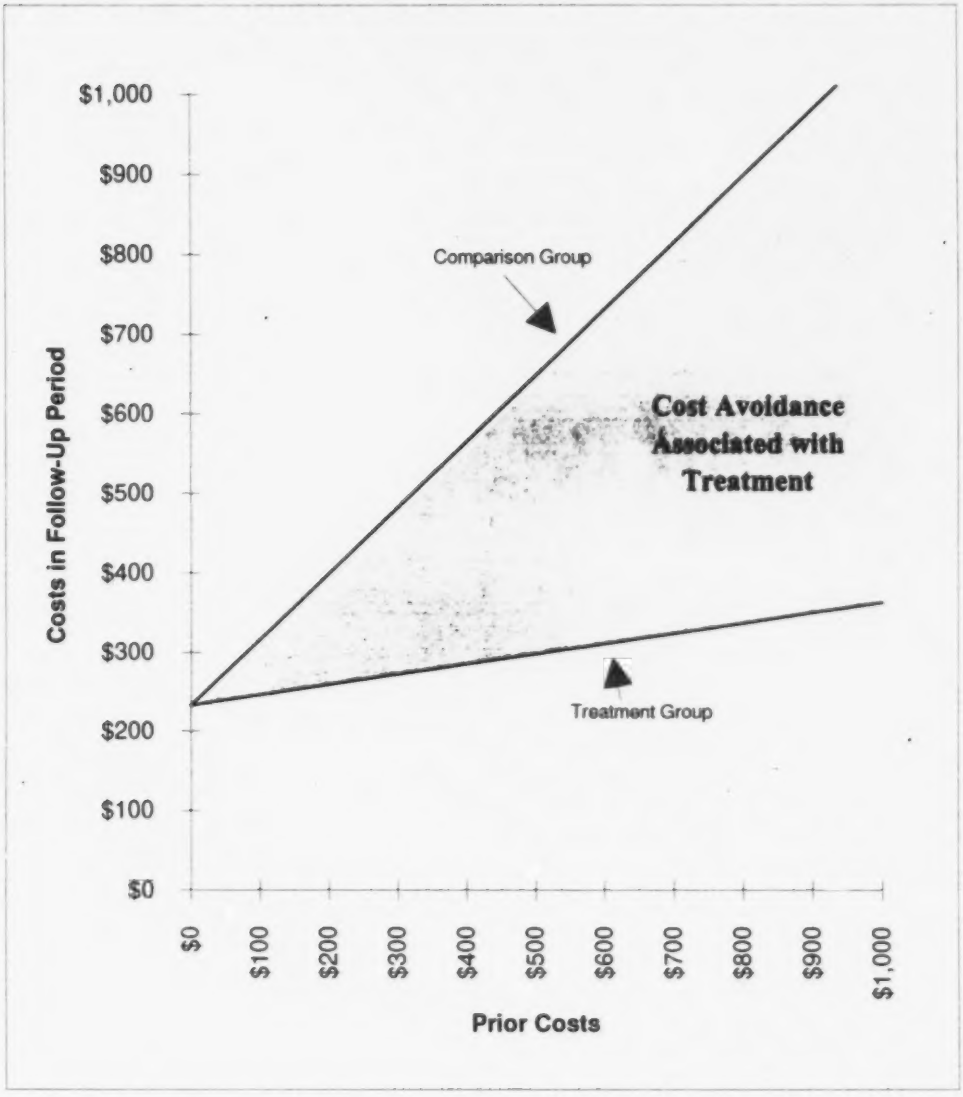
Among clients with the following characteristics, treated clients had *higher* outpatient costs than comparison clients:

- **High outpatient medical costs before treatment.**
- **A family history of chemical dependency.**
- **Pregnant at the time of assessment.**

(See significant treatment interactions in Appendix 4, Figure 4)

Among clients who did not have these characteristics, treated clients had *lower* costs than comparison clients. (See significant main effect of completing some or all treatment in Appendix 4, Figure 4).

Figure 5
Inpatient Medical Costs
Cost Avoidance Associated With Receiving Treatment:
Differences in Costs Related To Different Inpatient Medical Costs
Prior to the Treatment Period



The difference in slope between Treatment and Comparison Groups is statistically significant (.0001 level; see the interaction of treatment with prior inpatient medical costs in the statistical model results in Appendix 4, Figure 3.)

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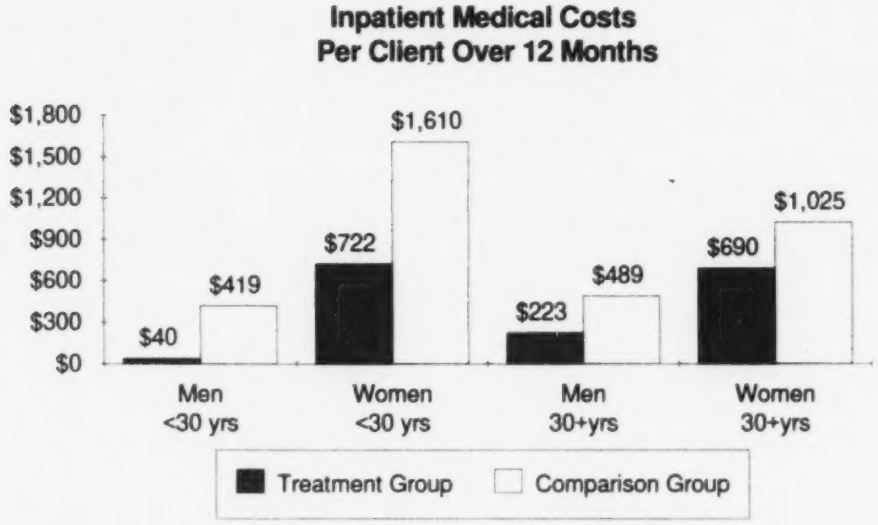
Figure 6
Overall Medical Costs
FOR CLIENTS IN FOUR AGE/GENDER COMBINATIONS
(Adjusted Costs between Treatment and Comparison Groups
in the 12 Month Follow-Up Period)*



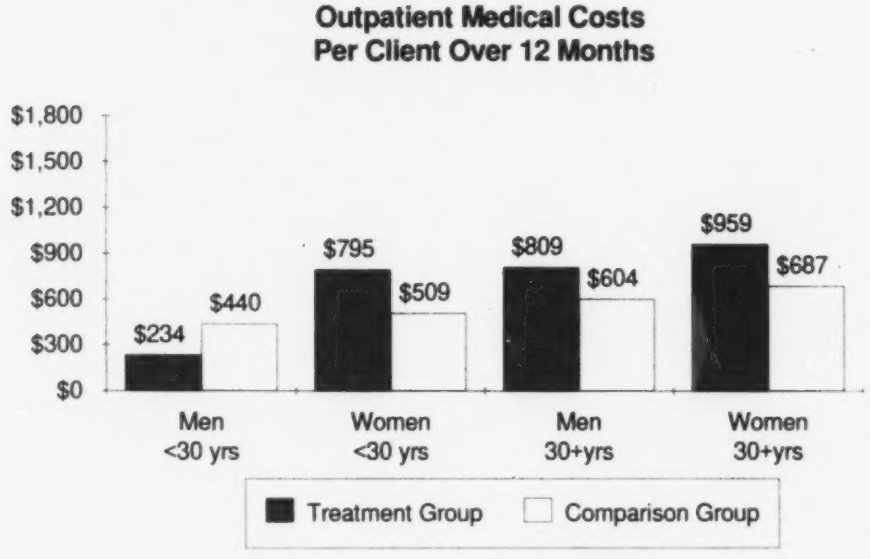
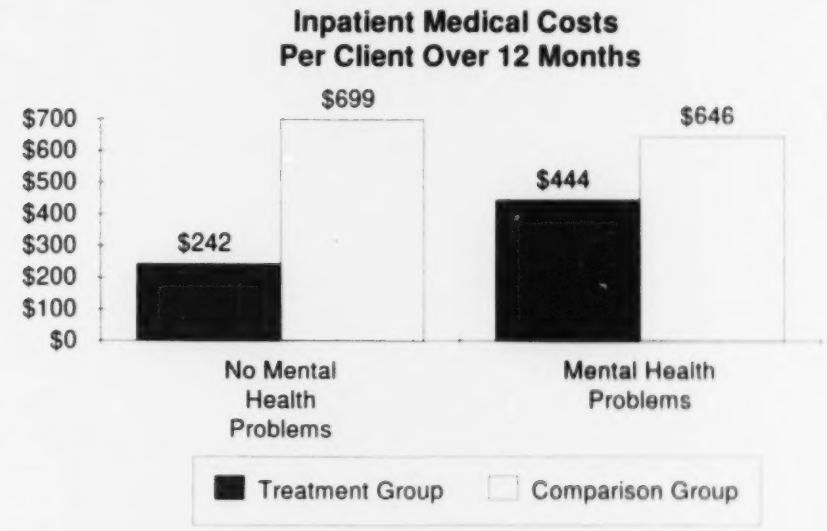
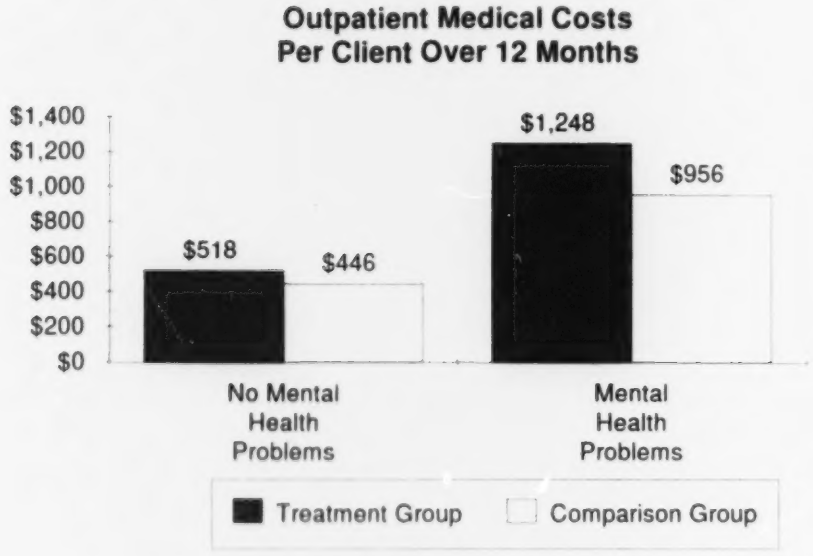


Figure 7
Overall Medical Costs
FOR CLIENTS WITH AND WITHOUT MENTAL HEALTH PROBLEMS
(Adjusted Costs between Treatment and Comparison Groups
in the 12 Month Follow-Up Period)*





* See note in Figure 4.

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Based on the above findings of the outpatient statistical model, outpatient medical costs were estimated for age, gender and mental health status groups:

- men under 30 showed a trend towards incurring less costs if treated, while all other age/gender groups tended to have higher costs if treated. (See Figure 5, bottom panel.)
- although not statistically significant, clients with mental health problems appeared to have higher costs if treated. (See Figure 6, bottom panel.)

DISCUSSION

Discussion and Implications of Lower Medical Costs

The average treated client is much less likely to have inpatient medical expenses in the 12 month follow-up period than the average non-treated client. This finding is particularly relevant considering that, for older clients and those with mental health problems, income assistance costs were higher after treatment but inpatient medical costs were lower. This suggests that while persons may be on welfare after treatment as a result of being incapacitated for work, they may have controlled their addiction to the point of reducing their incidence of disastrous medical episodes which require hospital care.

As we will discuss in Chapter 6, this difference in inpatient medical costs is the major factor determining any overall cost-avoidance to public service agencies due to treatment. Other studies of cost-effectiveness of treatment among middle class clients have shown that 'savings' from lower inpatient medical costs after treatment is one of the major components of all savings (Jones and Vischi, 1979: Harrison and Hoffman, 1988). It was not previously known whether this would also be the case for indigent clients, such as ADATSA clients.

Discussion and Implication of Similar Outpatient Medical Costs

On the other hand, we found that outpatient medical costs are similar for Treatment and Comparison Group clients. We have pointed out that this may be due to built-up medical needs before treatment. These costs may continue for some time. The data shows this is the case for treated clients who incurred high outpatient medical expenses before treatment, treated clients with a family history of chemical dependency and treated women who were pregnant at assessment. Based on these findings, outpatient medical costs were estimated to be higher for treated clients with mental health problems and all treated age/gender subgroups except for men under 30.

Further data collected for a longer period of time are necessary to determine whether treated clients will eventually show a decrease in these outpatient medical expenses.

5

RE-ENTRY INTO TREATMENT

This chapter addresses the extent to which regular ADATSA clients re-enter treatment for addiction. The focus is on distinguishing between different types of re-entry and their relative costs.

In the analyses, we have considered re-entry into various treatment programs, regardless of funding source, as long as the programs were certified by the state's Division of Alcohol and Substance Abuse (DASA) and reported to the Substance Abuse Management System (SAMS). This means that re-entry patterns are not tied exclusively to ADATSA eligibility rules.

The 12 month follow-up period used in our analyses appears to be long enough to include most re-entry due to relapse after treatment, since a review of the research literature indicated that almost all relapses occur within the first 9 to 12 months after treatment (Catalano et. al., 1987).

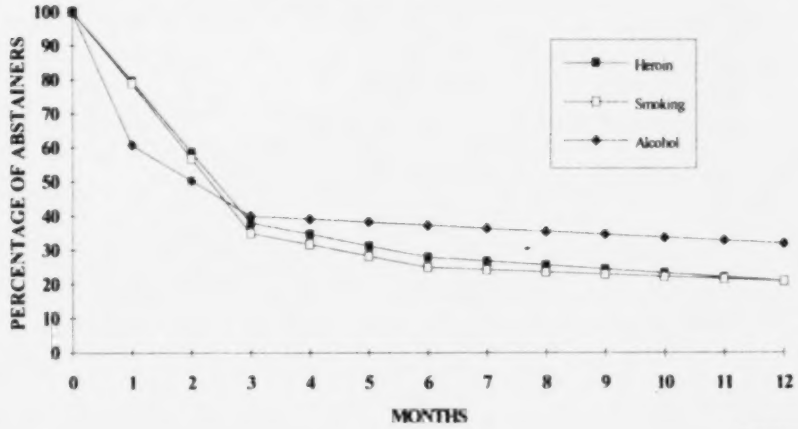
EXPECTED TREATMENT RE-ENTRY OUTCOMES

The Traditional Expectation

The traditional method of treating addiction involved one long and radical intervention with high expectations of success. Research has found a limited success rate for this approach. (See Figure 1 for expected abstention rates after one treatment intervention in the case of smoking, alcohol and heroin addictions.)

Figure 1

RELAPSE RATE OVER TIME

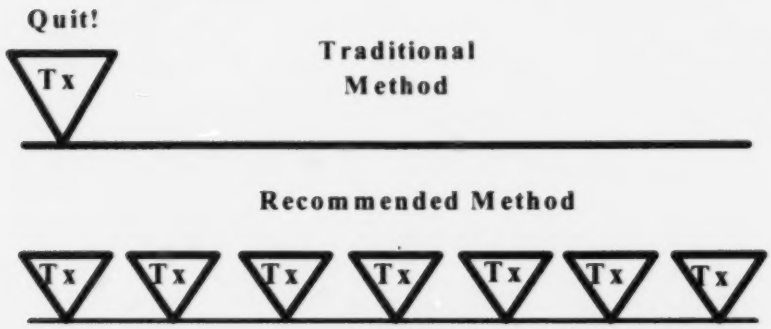


Catalano et. al., 1987: page 2.

The conceptualization of addiction shifted from a curable condition to a lifelong psychological and physical tendency (chemical dependency) requiring multiple interventions to maximize the likelihood of both temporary and long term recovery (see Figure 2 below for a visual representation of these two different strategies).

Figure 2

INTERVENTION STRATEGIES FOR VARIOUS FORMS OF ADDICTION



U.S. Department of Health and Human Services, 1990.

Summary research findings on successful quitting rates for smoking show about 15 percent quitting on the first intervention attempt, 25 percent on the second attempt, and then a slower growth to about 40 percent by the seventh attempt (Catalano, et.al., 1987). Similar summary results are not available for drug addiction due to the few studies conducted over a long period (10-15 years are necessary) and the difficulty in following-up such persons over a long time span. (Longabough 1988; Catalano et. al., 1987)

The Current Expectation of Multiple Treatment Episodes

The current general expectation is that most chemically dependent persons will require multiple treatment episodes* which may be interspersed over the course of a number of years (Gaffe, 1984; Hser 1988.) Therefore, a large proportion of ADATSA clients would be expected to re-enter treatment at some point after completing the program. This would be true even for those clients who had been successfully engaged in the recovery process during their ADATSA treatment.

Inpatient treatment and detoxification are required for some of these re-entry clients, particularly after a serious relapse. However, most recovering clients can be served appropriately by outpatient programs. These programs provide the often needed extra support in the reintegration and

* A **treatment episode** is defined as an unbroken period of participation in a planned program of treatment for addiction. An episode may be divided into inpatient and outpatient or other phases, and all of the planned treatment may not have been completed at the point of termination. ADATSA restricts funding to six months of treatment. Therefore an ADATSA treatment episode ends either after a break in participation or at the end of ADATSA funding.

aftercare phases of recovery. Clinical staff in ADATSA treatment programs recommended this 're-entry' as a continued form of treatment for many clients who, they felt, needed this extra support (Longhi, et.al., 1991: 39).

Expectations Applied to ADATSA Clients

This leads to the following detailed expectations:

- **re-entry into treatment for addiction will occur often among all groups of clients,**
- **inpatient and detoxification re-entry will be less for Treatment Group clients than for Comparison Group clients (since treated clients may relapse less), and**
- **outpatient re-entry will be more frequent for Treatment Group clients than for Comparison Group clients (since treated clients may be encouraged more to re-enter these programs).**

The legislatively mandated regulations of the ADATSA program also encourage the above pattern of re-entry. The rules concerning eligibility for the ADATSA program restrict treatment to six months in any two year period. Therefore, ADATSA clients who use less than six months in their current treatment episode may be eligible for more treatment within the two year period. However, given the scarcity of beds in residential treatment programs, a re-entry placement into an outpatient program is more likely. This may be an ADATSA outpatient program or, if the six months of funding has been exhausted, a community funded outpatient program.

Expectations Applied to Clients With Mental Health Problems

Clients who are both mentally impaired and chemically addicted (MICA clients) typically require a very structured treatment environment, but they are unlikely to have the sort of personal support system which could provide it while they are outpatients. As a result, they are more likely to need a residential treatment program. However, ADATSA beds in those longer term residential programs which provide appropriate mental health services are very scarce. Therefore, most MICA clients are placed in shorter and less appropriate programs (Longhi, et. al., 1991: page 34). Two possible consequences stem from this:

- **they are more likely to re-enter treatment, particularly if mental health problems impede their recovery from addiction, and**
- **they are more likely to re-enter a longer inpatient treatment program, which fits their needs better, resulting in higher re-**

RESULTS ON RE-ENTRY RATES AND COSTS

Overall Re-entry Into Either Inpatient or Outpatient Programs, or Both

Overall re-entry rates and costs for additional chemical dependency treatment are similar for Treatment and Comparison Group clients in the 12 month follow-up period.

	Re-entry	Costs
Treatment Group	43.2%	$ 466
Comparison Group	41.7%	$ 500

The overall re-entry rates and costs, shown above were obtained by adding the adjusted inpatient and outpatient rates and costs presented in Figure 3.

Re-entry rates for the 12 month follow-up period indicate the percentage of clients who re-entered for one or more days of residential treatment, for one or more visits in the outpatient treatment program, or for both.

Costs are the per client re-entry expenses over the 12 month follow-up period. Cost amounts vary by length of stay in residential programs, by frequency of outpatient visits, and by treatment fees: higher for residential programs, lower for outpatient programs.

Overall, re-entry occurs fairly often (as expected from the norm of multiple treatment episodes discussed earlier): slightly more than 40% of the clients, in both the Treatment Group and the Comparison Group, re-entered treatment within 12 months.

Overall, costs are relatively low compared to income and medical assistance costs reported earlier: about $500 for re-entry compared to about $1,863 for the total cost of income and medical assistance ($869 and $994 respectively).

However, the similarities between Treatment and Comparison Groups in overall re-entry rates and costs hide important differences in the kinds of treatment services received, in the types of clients who re-enter, and in the costs incurred by clients of differing mental health status. These differences will be discussed next.

Re-entry Into Inpatient Programs

Inpatient and detoxification re-entry costs are less for treated clients.

- Adjusted average re-entry costs for inpatient and detoxification programs were significantly lower for Treatment Group clients than Comparison Group clients: for clients with high pre-treatment, inpatient and detoxification costs or clients with no prior publicly funded services. (See significant interaction effect of treatment covering such costs: Appendix 5, Figure 1.)

* The adjustments had to be made separately for inpatient and outpatient re-entry due to the very different determinants for the two types of re-entry. (See Appendix 5, Figures 1,2,3 and 4.)

- Some subgroups of treated clients were exceptions and had higher inpatient re-entry costs. They are discussed below.

Inpatient and detoxification re-entry costs, were relatively low compared to the combined costs of income and medical assistance.

- In the follow-up period of 12 months, the per client cost of re-entry into inpatient treatment was $292 for the Treatment Group. This was much less than the total income assistance and medical costs per client of $1,863 in the same Treatment Group.

The adjusted average rates of re-entry into inpatient and detoxification programs appear to be lower: about 29% for the Treatment Group, and 38% for the Comparison Group. (See Figure 3 and Appendix 5, Figure 2)

Subgroup Differences in Inpatient Re-entry

One of the exceptions to the inpatient re-entry results found for treated clients is for clients with mental health problems, whose costs for these services were found to be higher if treated. (See Figure 4 and Appendix 5, Figure 1.)

- This was true only for costs, since the percentage of clients re-entering treatment was actually estimated to be lower: 42.6 percent versus 56.8 percent (See Figure 4.) *This means that treated clients with mental health problems had higher costs overall because the fewer clients who re-entered stayed in these programs longer.*

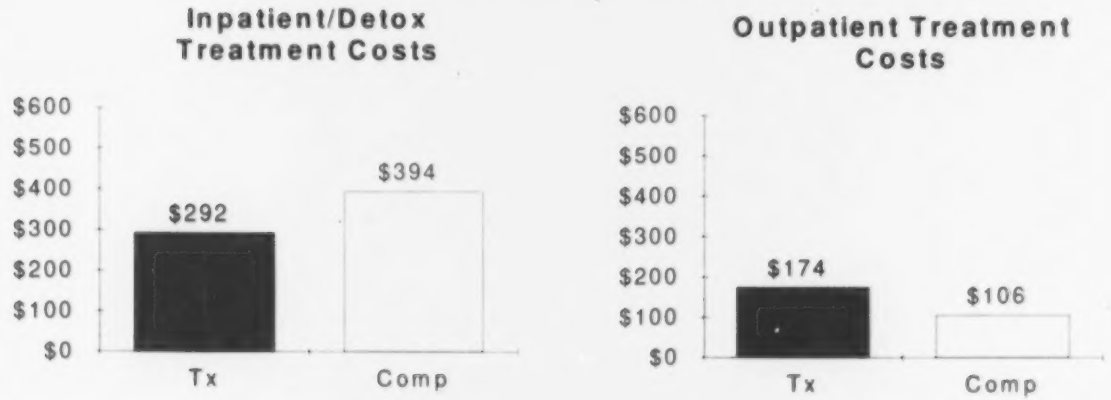
The other exception was that clients with the following characteristics all had higher costs for inpatient re-entry if treated: (See Appendix 5, Figure 1):

- more years of use
- more prior admissions for treatment
- on publicly funded services before treatment
- living on the street or in shelters
- younger (less than 30)

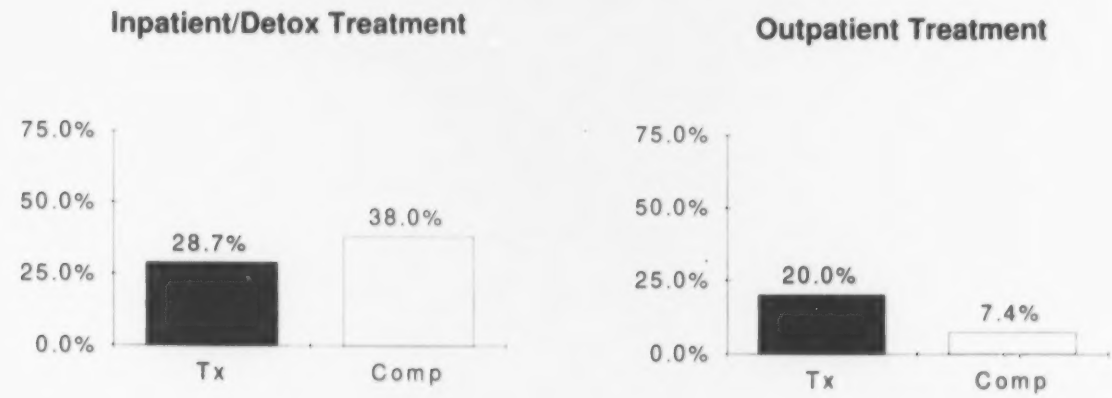
The above pattern of characteristics suggests two types of clients: *those with a longer history of use, more shelter and assistance needs and prior treatment attempts* who may need more inpatient treatment time; and *some younger clients who may have relapsed and re-entered for longer inpatient treatment*. These preliminary findings raise more questions than answers and deserve further study and analyses than are possible in this report.

Figure 3
Re-entry Into Treatment By Type of Services Received
FOR ALL REGULAR CLIENTS
(Adjusted Costs Between Treatment and Comparison Groups
in the 12 Month Follow-Up Period))*

Total Re-entry Cost Per Client Over 12 Months



Percentage of Clients Re-entering Treatment Over 12 Months



*Costs have been statistically adjusted for differences in client characteristics between Treatment and Comparison Groups for the following significant factors:

- **for total per client costs of inpatient/detox reentry** -
  client age, mental health problems, homeless or living in a shelter, years of drug/alcohol use, prior admissions to treatment, having inpatient versus outpatient treatment, prior receipt of some form of publicly funded services and prior use of inpatient/detox treatment;
- **for probability of reentry into inpatient/detox treatment** -
  client gender, mental health problems, years of drug/alcohol use, prior ADATSA assessment, DWI involvement and prior receipt of some form of publicly funded services.
- **for total per client costs of outpatient reentry**
  client living on their own, a court prompted assessment, having indication of medical problems, prior outpatient medical assistance and prior outpatient chemical dependency treatment;
- **for probability of reentry into outpatient treatment**
  client gender, race, living on their own, a court ordered assessment, having indication of medical problems, prior attempted suicide, prior outpatient medical assistance, family history of chemical dependency and prior outpatient treatment.

For statistical details see results of statistical models in Figures 1, 2 , 3, and 4, Appendix 4.

Re-entry Into Outpatient Programs

The amount of use of outpatient services is similar for treated and for non-treated clients.

- The costs were not significantly different between Treatment and Comparison Groups, even though the specific adjusted dollar amounts were slightly higher for treated clients: $174 versus $106. (See Figure 3.)*
- The adjusted re-entry rates were found to be higher for treated clients, 20% versus 7%, but this may only be a trend since the difference is not quite large enough for statistical significance (.11 level for the main effect of treatment and counter balance interactives of treatment. See Appendix 5, Figure 4.)**

Although the amount of use does not decrease for treated clients, the costs of these outpatient services are the lowest of all previously discussed publicly funded services costs incurred by treated clients after treatment attempts.

The characteristics of clients which predict how treatment may affect outpatient re-entry costs are almost totally different from those which predict the way it may affect costs of re-entry into inpatient/detox treatment programs.

- The characteristics related to outpatient re-entry costs were: prior outpatient medical and treatment costs, having a court prompted assessment, the social living situation prior to treatment and being white. These factors may be indicators of clients with a continuing need for formal social support and the ability to fulfill this need by re-entry into outpatient treatment.
- The characteristics related to inpatient/detox re-entry costs were: number of years of substance abuse, prior publicly funded services, prior ADATSA treatment, living in the streets, and mental health status. These factors are probably related to the persistence of chemical dependency and a related lack of coping skills.

These results support our earlier expectations that clients re-enter inpatient and outpatient programs for different reasons. However, more research is needed to uncover specific patterns of client characteristics, timing and reasons for re-entry.

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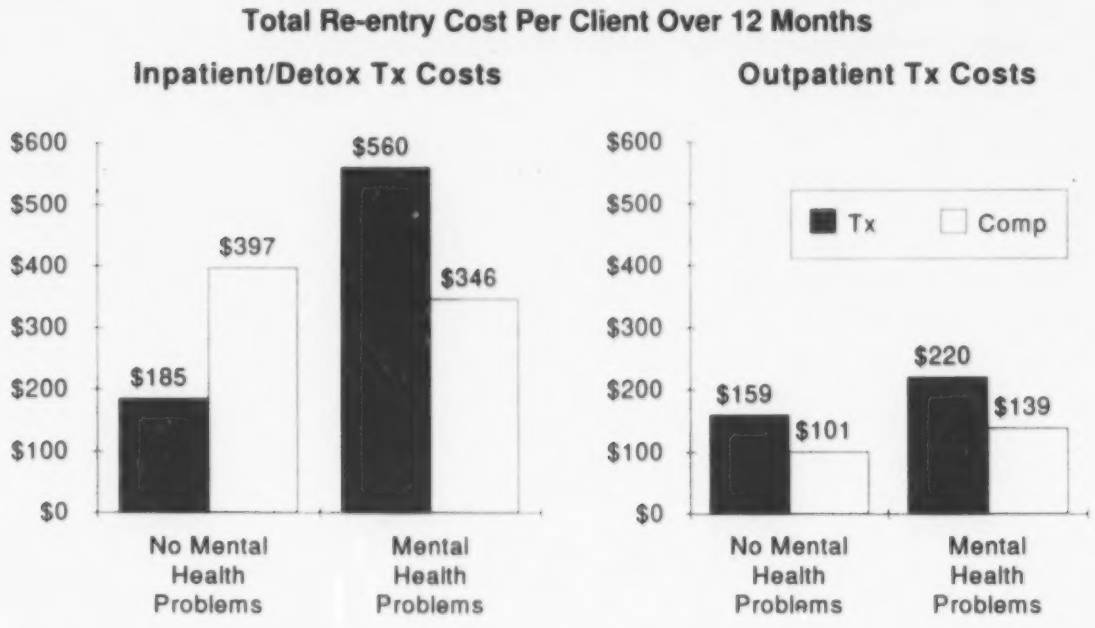
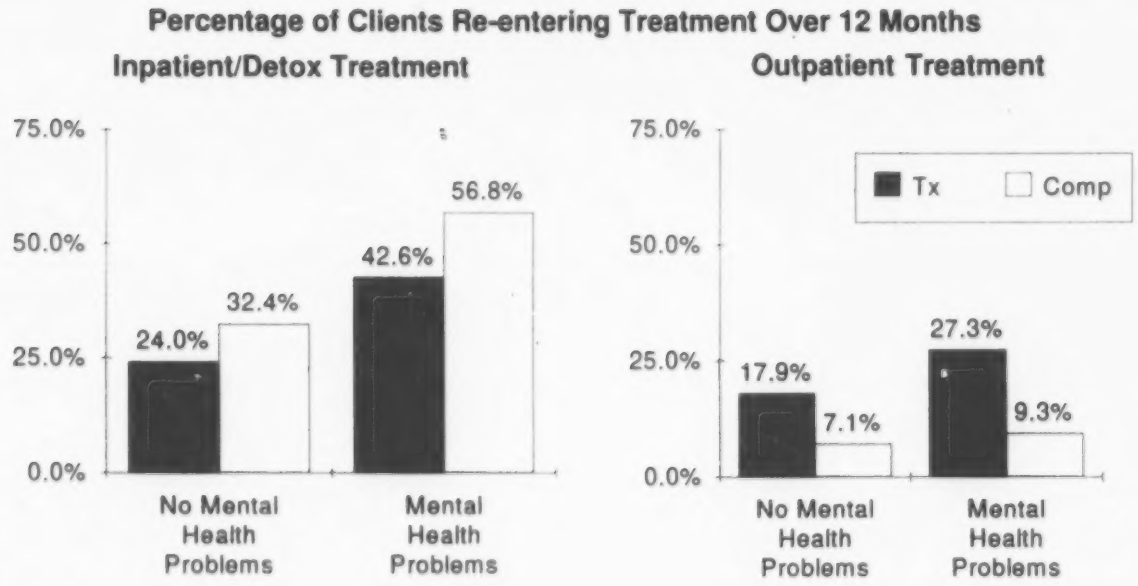
* These results were the net effects of a complex pattern of interaction effects. (See Appendix 5, Figure 3):
  - significantly lower outpatient re-entry costs for those with higher prior outpatient treatment costs, and/or higher outpatient medical costs and/or prior medical problems;
  - significantly higher outpatient re-entry costs for those clients who were white, and/or living alone and/or whose assessment was prompted by the criminal justice system.

** The interactive treatment effects on the odds of clients re-entry outpatient treatment were:
  - significantly lower odds if treated for those with higher prior outpatient treatment costs, and/or higher outpatient medical costs and/or prior medical problems;
  - significantly higher if treated for those clients who were white and/or female, and/or living with a family and/or had attempted suicide, and/or whose assessment was prompted by the criminal justice system.

Figure 4
Re-entry Into Treatment
By Type of Services Received
FOR CLIENTS WITH AND WITHOUT MENTAL HEALTH PROBLEMS
(Adjusted Costs Between Treatment and Comparison Groups
for the 12 Month Follow-Up Period)*



Percentage



62 * See adjustments in Figure 3.

DISCUSSION

Discussion and Implications of Inpatient Re-entry

To the extent that re-entry into residential treatment programs indicates a serious relapse in the recovery process, the above results reflect *positively* on the effectiveness of ADATSA treatment. Overall, significantly fewer clients re-enter residential programs after treatment presumably because they are less likely to relapse.

There are exceptions. Among them is the higher use (measured by higher costs) of residential treatment programs by clients with mental health problems. A likely explanation is that a longer time is required to treat clients who are both mentally impaired and chemically addicted - the so-called MICA clients. The other exceptions include clients with more years of use, more shelter and assistance needs and prior treatment attempts.

One could argue that ADATSA treatment is failing these clients the first time and, therefore, clients are returning for more treatment. However, one could also argue that ADATSA made the best attempt to treat these clients within the constraints of ADATSA rules and funding. Because of these constraints, clients may not be placed in the most appropriate programs: the content of treatment may not be suitable and/or the length of treatment may be insufficient. From the latter point of view, the fact that some of those clients who were not sufficiently helped are coming back for longer treatment, whether funded by ADATSA or not, reflects positively on the ADATSA program.

Whichever argument reflects what is actually occurring may not be as important as the fact that some clients, specifically those with mental health problems, may have special needs which are not being met in the current ADATSA program. One of the public policy costs of not addressing this issue is the higher re-entry costs of these clients.

Discussion and Implications of Outpatient Re-entry

We expected a higher rate of re-entry into outpatient programs among treated clients. We found a trend in this direction. Clients who need more support in the lifelong recovery process are encouraged to 're-enter' or, as clinicians say, continue seeking help. From a public policy perspective, the cost of these outpatient services is relatively minor and they are probably cost effective. If these services reduce the likelihood of serious relapses and consequent deterioration of physical health, they may also reduce the much higher costs of further residential treatment and of further reliance on income and medical assistance.

The pattern of findings regarding which particular clients tend to re-enter outpatient treatment more and which re-enter less is complex and not easily interpretable. A follow-up study of even longer duration is necessary to uncover the patterns and reasons for re-entry.

6

TOTAL COST AVOIDANCE

The major question addressed in this chapter is whether ADATSA treatment results in an overall avoidance of further costs for public service agencies among regular ADATSA clients. The concern is to determine the major sources of this overall cost avoidance. The final objective is to measure the magnitude of the avoided costs relative to the amount expended for treatment.

THE COST AVOIDANCE APPROACH

Definition

Cost avoidance was calculated by determining the difference between an estimate of what ADATSA clients would have cost public agencies if they had not been treated, and the actual cost to public agencies after treatment. If the actual cost is lower than the estimated cost without treatment, then cost avoidance has been achieved. **This difference in costs was obtained by subtracting the adjusted costs incurred by clients in the Treatment Group from the adjusted costs incurred by clients in the Comparison Group.**

Cost avoidance has two interrelated aspects: avoidance of public costs other than for substance abuse treatment and avoidance of further substance abuse treatment costs.

- The non-treatment costs were for two major publicly funded services programs: income assistance and medical assistance.
- Further treatment costs were re-entry costs sustained during the follow-up period by clients who had received ADATSA treatment, compared with treatment costs during the follow-up period sustained by clients who were eligible for but did not receive ADATSA treatment during the same time period as the other (treated) clients.

Limitations

Public agency costs are defined as expenditures for state or county sponsored programs, funded by federal, state or local public revenues. We would have liked to distinguish among funding sources. However, our data did not permit us to do so for certain kinds of programs, particularly community treatment ones. Therefore, we present the results of total costs irrespective of public funding source.

We would have liked to add jail and prison costs to this analysis. This is a major item among public agency costs incurred by those ADATSA clients with criminal involvement. However, jail information was not readily available. Prison information was available but the subpopula-

tion of ADATSA clients with recent felony offenses was not large enough to enable us to do a comprehensive statistical analysis. A preliminary analysis of the treatment outcomes in this sub-population is presented in Chapter 7.

Questions Not Answered By the Cost Avoidance Analysis

This cost avoidance analysis will not answer some often asked cost-benefit questions:

- Does treatment pay for itself by reducing the societal costs of drug/alcohol abuse?
- Which type of treatment is most cost-effective?

Our cost avoidance approach is limited in scope. It takes into consideration the avoidance of further public costs, not the avoidance of costs to society as a whole due to treating 'socially high cost' addicts.

It has been argued already that **society** recovers the costs of alcoholism treatment partly during treatment and partly soon thereafter, irrespective of long term effects. This is because alternative costs to society such as crime related costs (law enforcement, courts, jails, victim expenses), automobile accidents costs, and medically costly injuries and illnesses, are avoided **during** treatment itself and soon thereafter (Jones and Vischi, 1979). A reviewer of the literature, even ten years ago, concluded that "the benefits of alcoholism treatment, even if they fall short of what may be claimed, seem to be in excess of the costs of providing such treatment" (Saxe et. al., 1983: 66).

Whether this is true for treatment of indigent clients, not only of middle class ones, is not known. Some societal losses may be higher for indigent clients (such as those related to crime), and some lower (such as loss of productivity, since few indigent clients worked before treatment). This is a topic for another study.

The narrower focus of this report is cost avoidance to public service agencies. The ADATSA program was created by the legislature in part to avoid higher alternative public expenses (ABC's of ADATSA, 1990). It is still a public policy concern, a particularly relevant one in times of budget cuts. A cut in funding of treatment services may raise expenses in other public programs.

It is important, therefore, to contrast our narrow cost avoidance approach with two other more general but prevalent approaches: the societal economic cost of drug and alcohol abuse, and the cost-effectiveness of treatment.

Societal Economic Costs

Individual economic contributions to society as a whole are stressed in order to analyze society-wide costs of drug/alcohol abuse. For example:

- Loss of earnings and relative tax revenues due to the higher mortality rate among chemically addicted persons are high cost factors to the society at large.
- In the same way, a very high loss to society is the lower productivity or total incapacity to work of many chemically addicted persons.

These are the two largest economic costs of drug and alcohol abuse for Washington State, as well as for other states, as shown by many economic studies (Wickizer, et al., 1993; Liu, 1992; Rice et al., 1990; Felix, 1989; Harwood et al., 1984; Berry and Bolland, 1977).

These studies calculated societal costs based on many of the following factors, ordered in terms of magnitude of associated costs for the State of Washington (Wickizer et al., 1993):

- **Mortality** - the loss of productivity due to premature deaths-measured by the estimated average income lost per individual;
- **Morbidity**- the same loss of productivity due to total incapacity, or due to reduced capacity to work - measured by estimating prevalence rates of chemical dependency times the estimated average lost income per individual;
- **Crime** - the direct costs of crime, including costs of police, criminal justice, jail or prison; and the indirect costs, measured by estimated property damage and the loss of productivity sustained by the crime victims and by the perpetrators of the crimes, due to their incarceration;
- **Medical care** - the higher risks of illness and injury, such as automobile accidents associated with alcohol/drug addiction, with concomitant increases in inpatient and outpatient medical costs;
- **Related costs** - vehicle damages, legal and insurance costs due to alcohol/drug related automobile accidents, property destruction due to alcohol/drug related fires, and social welfare administration costs related to alcohol/drug programs;
- **Treatment**- privately and publicly funded treatment programs, both inpatient and outpatient;
- **Closely associated diseases-AIDS, Hepatitis and Fetal Alcohol Syndrome** - costs measured by estimating the higher rates of mortality, morbidity and medical care associated with these diseases, plus the additional costs of institutional and social care.

As is obvious from list on the previous page, societal economic cost calculations have many more factors than estimated public cost avoidance.

There are some similarities; both approaches include medical and substance abuse treatment costs. But cost avoidance here only considers the cost of **publicly** funded services, for which only indigent clients are eligible. Societal economic costs include insurance-paid medical care and privately funded treatment services received by a much broader section of the population.

There are also other differences. Cost avoidance includes income assistance costs which are truly major costs from the point of view of public service agencies. In terms of societal costs, however, these do not represent true economic costs, since they do not reduce total societal income. They constitute a publicly determined "redistribution of income" obtained from taxing in various ways the total income generated by the population.

The other major difference between the two approaches is that societal costs involve **all persons who are chemically addicted**. This is regardless of income level or property owned, regardless of whether they seek help or not for their addiction, and regardless of type of costs incurred, private or public. The cost avoidance approach, instead, is concerned with persons who are **indigent, seek help, and are eligible for publicly funded treatment programs**.

One could conceive of a study which addresses the question of whether treatment has overall societal benefits which offset the costs of treatment. These benefits would be measured by the treatment generated reductions in the overall societal economic costs due to drug and alcohol addiction. This would be a full fledged cost benefit analysis, in which both the costs of treatment **and** the various benefits can be measured and compared monetarily. It would involve the study of **all people** in two or more matched localities for an extended period of time with known prevalence of drug/alcohol abuse. One of these localities would have treatment services, the others would not.

Given the impracticality of such studies, the difficulty of monetarily measuring all treatment outcomes, and the interest in studying the effectiveness of treatment programs of different costs, researchers have resorted to other approaches termed "cost-effectiveness" studies.

Cost-Effectiveness Studies

These studies measure the cost of treatment in dollars, but estimate program impact in other units. They follow the lead of studies which purely evaluate the efficacy of treatment in terms of various outcomes. These include outcomes such as:

decreases in alcohol/drug use,
longer average number of days abstained,
less absenteeism at work,
less injury related hospitalizations and medical care, and
decreases in number of arrests.

The extensive literature on drug treatment effectiveness was recently reviewed and the results concisely summarized by Anglin and Hser (1990). This summary was reported by Apsler and Harding (1991: 59-60) "in order to describe the current state of knowledge about treatment effectiveness." It is worth repeating this summary here (with our underlining) even though it focuses only on drug dependence, not drug and alcohol dependence.

- *There is no simple cure for drug dependence.*
- *Once drug dependence has developed, the problem can persist as a chronic condition and relapse is often the rule.*
- *The majority of clients in most treatment programs have traditionally been, and remain, opiate abusers.*
- *Evaluation studies are mostly based on opiate users in methadone maintenance programs. However, findings regarding other drug dependencies and other modalities are typically consistent with those reported for methadone maintenance.*
- *All major treatment modalities can be shown to have some positive effects on the clients in the criteria of drug use, criminality, employment, and other aspects of social functioning.*
- *For most types of programs, the more time clients spend in treatment, the more positive are their long-term outcomes.*
- *A significant proportion of those seeking treatment do not stay in treatment for more than a few weeks.*
- *Dropout rates are high for all modalities except some methadone maintenance programs.*
- *Clients entering treatment under legal coercion do as well as those without such pressures.*
- *Typically, an intact marriage, a job, shorter drug use history, low levels of psychiatric dysfunctioning, and a history of minimal criminality predict a better outcome in most programs.*

- *Demographics are related to likelihood of entering treatment but are only moderately associated with outcome.*
- *Program characteristics, such as quality of staff, breadth of services, and morale, are often significant determinants of outcome.*

As one can see from the underlined portions of this summary, there are similarities between what this ADATSA report has identified as treatment outcomes and what Anglin and Hser reported as 'the current state of knowledge of treatment effectiveness.' However, there is no mention of direct cost avoidance to public agencies after treatment. This is probably due to the fact that most studies, until recently, have focussed on treatment outcomes for middle class clients, not for indigent clients (see for example CATOR's past reports on middle class persons: Harrison and Hoffman, 1988, 1989; Harrison, Hoffman and Streed, 1991).

Cost-effectiveness studies add a cost of treatment dimension to the analysis of effectiveness. They ask whether similar outcomes could be achieved with lower treatment costs. This was motivated, historically, by the interest in reducing costs as budgets were cut and demand for treatment grew in the 1970's (Saxe, et al. 1983). The debate often took the form of comparing the effectiveness of outpatient versus inpatient programs. More recently, interest lies in the potential increase in cost-effectiveness by increasing length of aftercare programs, which are relatively inexpensive, and by matching appropriate treatment to different kinds of clients (Apsler and Harding, 1991: 69).

Turning to a review of these cost-effectiveness studies the same authors, Apsler and Harding (1991: 66-78), note the rarity of such studies in the research literature. They also emphasize the major methodological problems present in these studies: the often absent comparison groups, unreliable outcome measures and inadequate time frames. The latter are crucial for the proper definition of a treatment episode and of a sufficient follow-up period to capture long term effects.

Our cost avoidance approach is closest to this relatively new and evolving system of investigation. We have defined treatment episode, time frames, treated clients and comparison groups. We have avoided one time measures of outcomes, and avoided less reliable self reports and retrospective data. Outcomes have been measured monthly before and after treatment, for both treatment and comparison groups, using state records.

What is different, and useful, is that we have been able to measure in common monetary units different outcomes (use of income assistance, medical care and re-entry) so that an overall cost avoidance measure can be obtained for a combination of outcomes.

Cost Avoidance Analyses and Presentation of Results

This study's analyses on cost avoidance were conducted in four distinct stages. The presentation of the results of these analyses follows the same four stages.

- We first consider whether costs are avoided overall, averaging the results across all regular ADATSA clients.
- Secondly, "gateway" effects are considered since cost increases due to clients newly entering the publicly funded services system confound the cost avoidance effects of treatment.
- Thirdly, we examine important differences in cost avoidance among some subgroups of ADATSA clients: by age and gender groups, and by mental health status.
- Lastly, we compare the cost effectiveness of treatment in avoiding further costs among all the above groups of clients by examining the cost avoided relative to the cost of ADATSA treatment. This takes the form of comparisons of cost avoidance rates.

OVERALL COST AVOIDANCE RESULTS

Major Findings

Overall, there is a small, but not statistically significant, cost avoidance effect among treated clients. This apparent lack of effect is actually a result of significant cost avoidance for some and significant cost increases for others.

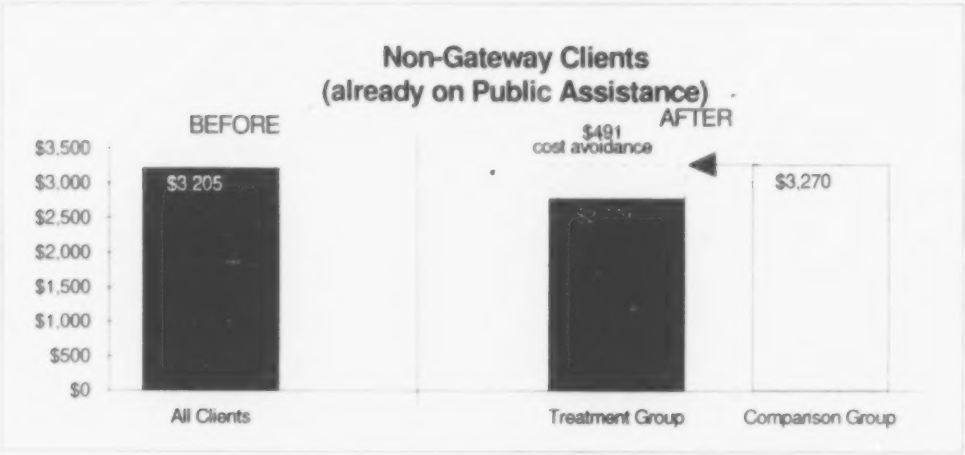
- ***High cost avoidance due to treatment occurs among clients with high previous costs and among younger men.***
- ***High cost increases among treated clients occur for pregnant women and for clients with mental health problems.***
  - ***Pregnant women need prenatal and delivery services and tend to obtain them, if treated;***
  - ***Clients with mental health problems need more treatment and assistance than ADATSA can provide and they are successful in obtaining these services, if treated.***

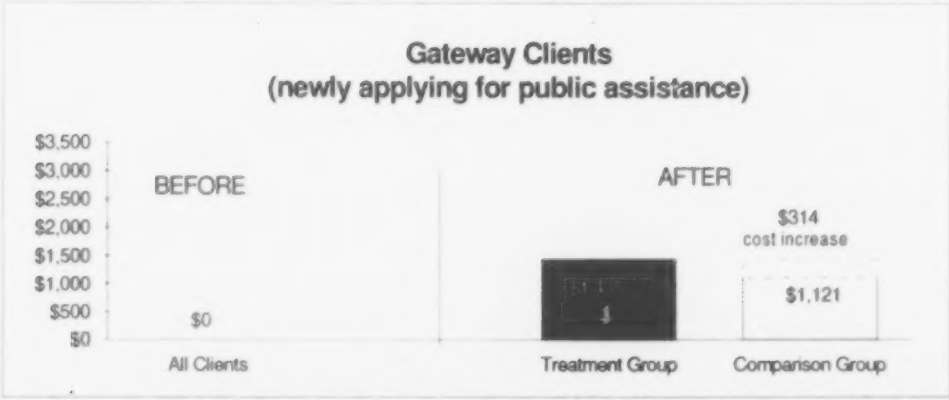
The detailed overall findings and the results of the multivariate statistical analysis are presented below.

Amount and Source of Costs Avoided Overall

- **Overall, the balance of the opposing effects of treatment on different client subgroups was a small, non statistically significant cost avoidance effect of $222 per client, over the 12 month follow-up period.**
  (See Figure 1, top chart)
- **Any overall cost-avoidance was generated by the overall lower medical costs among treated clients: $256 lower.**
  (See Figure 2, top chart).

Figure 1
Overall Publicly Funded Services Costs:
AVOIDANCE OR INCREASE
(Adjusted Costs between Treatment and Comparison Group in the 12 Month Follow-Up Period))*





Note: The Treatment Group consists of 39% "gateway" clients; the Comparison Group has 29% "gateway" clients; overall 33% are "gateway" clients. Total costs include all income assistance, medical and treatment re-entry costs. The before costs are for all ADATSA eligible clients: Treatment plus Comparison Groups. The after costs are the statistically adjusted costs during the follow-up period.

* The adjustment was made for the following significant factors: client age and gender, mental health problems, pregnancy at time of assessment, court prompted assessment and total assistance costs 12 months before treatment.

For statistical details see the results of the statistical model in Figure 1, Appendix 6.

The reason for the slight cost avoidance effect, overall, is that it is the net result of significant positive and negative effects. These effects vary, depending on client characteristics. Statistically, these are called "interactions" of treatment with various client background characteristics. Each "interaction" has an independent effect on cost avoidance, controlling for the effects of the other "interactions."

Costs Avoided by All Treated Clients

- *Treatment had a significant independent effect on cost avoidance by differentially reducing the influence that costs before treatment had on costs after treatment.* **Treated clients with high previous costs had significantly lower costs after treatment, while comparison group clients continued having higher costs. The higher the treated clients' prior costs the higher the cost avoided. These effects are independent of all other client factors controlled in the statistical model.**

Two particular estimates of the *magnitude* of cost avoided due to this independent interactive effect of treatment are presented below. These effects are independent of all other client factors controlled in the statistical model.

- *For the average treated client (i.e. with prior costs of $2,531) the amount of cost avoided was $363.*
- *For the average treated client already on assistance (i.e. with higher prior costs of $3,205), the amount of cost avoided was higher: $545.*

(See the significant interaction between treatment and prior total costs in the statistical model in Figure 1, Appendix 6.)

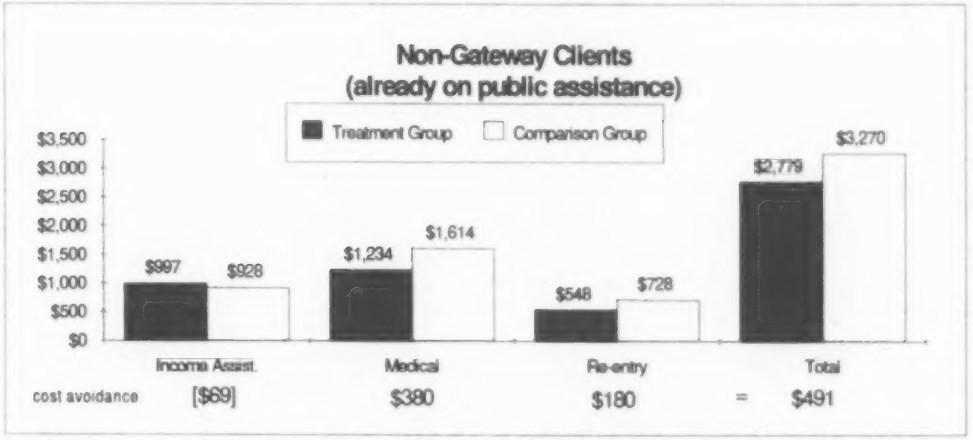
Further Cost Increases and Decreases Among Subgroups of Treated Clients

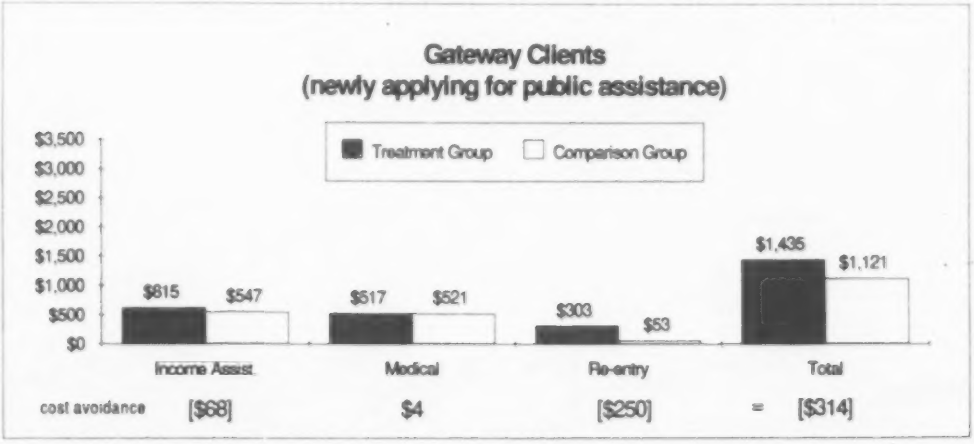
- ***The combination of being a man under age 30 and being treated had a further independent cost avoidance effect-*** **a cost avoidance of $709 more than for other age/gender treated clients.***
- *Having mental health problems and obtaining treatment generated a cost increase-* **a cost increase of $1,174 over that of clients without mental health problems.**
- *Being a pregnant women and being treated was associated with another cost increase-* **a cost increase of $4,352.**

(See the results of the statistical model in Appendix 6 showing significant interactions of treatment among clients with the above mentioned characteristics)

* This result is significant only at the level of trend (.0999 significance level). It is reported here due to the evidence of age/gender differences in outcomes presented in previous chapters.

Figure 2
Overall Publicly Funded Services Costs
BY TYPE OF COST (INCOME ASSISTANCE, MEDICAL AND TREATMENT RE-ENTRY)
(Adjusted Costs Between Treatment and Comparison Group in the 12 Month Follow-Up Period)*





Note: The Treatment Group consists of 39% "gateway" clients; the Comparison Group has 29% "gateway" clients; overall 33% are "gateway" clients. Total costs include all income assistance, medical and treatment re-entry costs. The before costs are for all ADATSA eligible clients: Treatment plus Comparison Groups. The after costs are the statistically adjusted costs during the follow-up period.

* The adjustments were made according to the results of the statistical models in Appendices 4, 5, and 6.

THE "GATEWAY" EFFECT AND COST AVOIDANCE

The above overall findings hide still another important difference in cost avoidance: the "gateway" effect. This effect was described in detail in the previous chapter. In essence it is based on the fact that the first step in the application to obtain eligibility for ADATSA treatment at a local Community Services Office (CSO) is also the route ("gateway") to eligibility for other assistance programs for "gateway" clients (those clients not currently receiving any publicly funded services). This can result in a major increase (from zero) in publicly funded services costs for these clients during the follow-up period, based upon the CSO visit itself. "Gateway" clients constitute 33% of regular ADATSA clients: 39% of the Treatment Group and 29% of the Comparison Group..

"Gateway" Major Findings

In general the results show that the small overall cost avoidance represents the net effect of two other contradictory tendencies:

1) **substantially *lower costs* for "non-gateway" clients in the Treatment Group (due mainly to their lower medical costs),**

   and

2) **slightly *higher costs* for "gateway" clients in the Treat - ment Group (due to their subsequent higher treatment re-entry costs).**

Clients Already on Publicly Funded Services

Among "non-gateway" clients, ***Costs were substantially lower for* the Treatment Group compared to the Comparison Group:**

- ***$491 lower costs* over the 12 month follow-up period.** (See Figure 1, middle chart)
- **The major basis for this cost avoidance was that overall medical costs among treated "non-gateway" clients were $380 or lower.** (See Figure 2, middle chart)

"Gateway" Clients

Among "gateway" clients, *costs were higher* for the Treatment Group than for the Comparison Group.

- ***$314 higher costs*, over the 12 month follow-up period.** (See Figure 1, bottom chart)

Statistical Note: Statistical support for the "gateway" findings is based on the statistically significant interaction of treatment with total prior costs incurred by clients. Prior costs, coded 0 or more include the dichotomous 0 "gateway", 1 is "non-gateway" clients (see Appendix 6, Figure 1). It is also based on the statistically significant interaction of treatment and "gateway" statue on re-entry into inpatient treatment and corresponding higher inpatient re-entry costs. (See Appendix 5, Figures 1, 2).

We have argued that the reason for high costs in the follow-up period among all "gateway" clients in general, whether treated or not, is that clients became eligible not only for ADATSA, but for other programs when applying for help at the local Community Service Office. The data seem to support this.

As expected, "gateway" clients in the Treatment Group became eligible for income and medical assistance, and incurred welfare and medical costs after treatment, at levels similar to those of the Comparison Group, with differences between groups of only $68 for income assistance and $4 for medical services. (See Figure 2, bottom chart.)

The unexpected finding is that "gateway" clients in the Treatment Group had higher substance abuse treatment re-entry costs than "gateway" clients in the Comparison Group: $250 higher. Most of these costs were outpatient costs: $167 (See Figure 2 in Appendix 6).

This finding is intriguing. It suggests a higher need for aftercare support among treated "gateway" clients, or easier access to treatment, or both. Our data, unfortunately, cannot distinguish among these possible explanations of need versus availability.

A Note on Costs Before and After Treatment for the Treated Clients

We cannot easily measure cost avoidance effects due to treatment by looking at the difference in costs before and after treatment for clients who went through treatment. The results of the before-after difference are confounded by the "gateway" effect.

- **"Gateway" clients become eligible for other assistance programs along with financial eligibility for ADATSA and therefore cost more after treatment: on the order of $1,000 plus.** (See Figure 1, bottom chart and Figure 2 in Appendix 6).

On the other hand, when we look at "non-gateway" clients (those already on assistance), we find that the before-after analysis and the treatment-comparison group analyses presented earlier, using adjusted data, show similar results:

- **There is evidence of a substantial decrease in costs, from before to after treatment, among clients in the Treatment Group, of about $400.** (See Figure 1, middle chart and Figure 2 in Appendix 6.)

COST AVOIDANCE AMONG AGE AND GENDER SUBGROUPS

In the previous sections we have focused on uncovering the unique independent cost avoidance effects, and on how they "net out" overall. It is useful now to see how *all* the factors influencing cost-avoidance analyzed so far impact the four age/gender groups we have distinguished in other outcome analyses: younger men, younger women, older men and older women.

Major Age/Gender Findings

We find that cost avoidance differs greatly by age/gender group.

- **Consistently high cost-avoidance is obtained among men less than 30.**
- **A substantial cost-avoidance occurs overall for women less than 30, but some contradictory cost tendencies are found.**
- **Clients over 30 show no cost-avoidance.**

In particular, the results are:

Men Less Than 30

Men less than 30 consistently showed high cost avoidance:

- **about $800 overall.**
- **about $875 for "non-gateway" clients,**
- **about $500 for "gateway" clients,**

(see Figure 3)

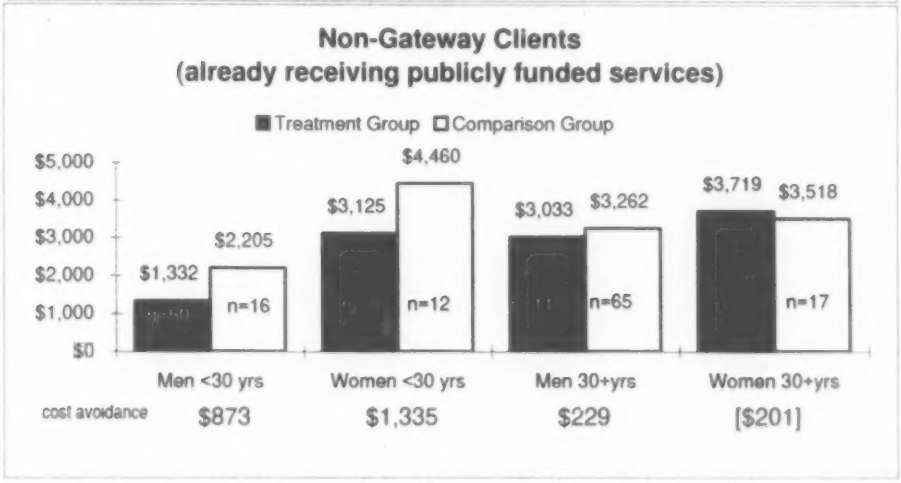
Women Less Than 30

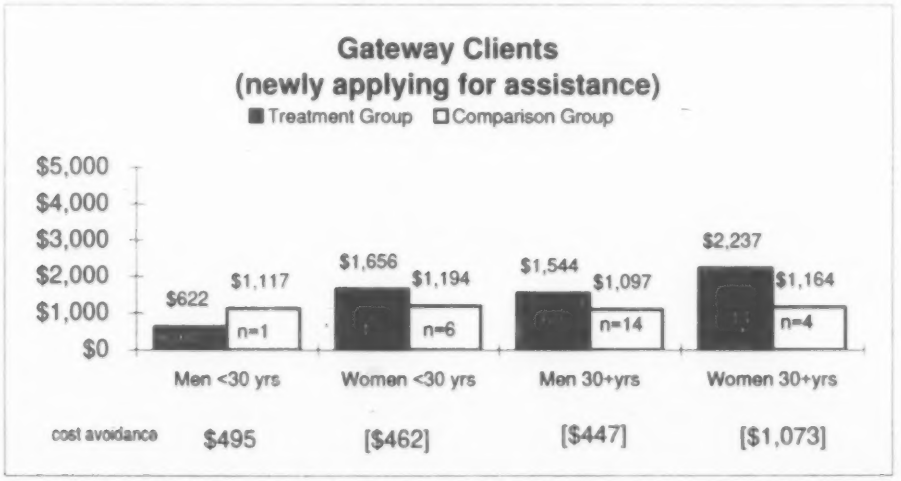
Women less than 30 also showed substantial cost-avoidance overall, $800, but contradictory cost tendencies.

- **Among "non-gateway" clients cost avoidance was very high: about $1,300.**
- **Among "gateway" clients younger women had higher cost if treated: higher by about $500.**

A possible reason for these apparently contradictory findings is that treated "gateway" women who are pregnant are more likely to get Medicaid funded perinatal services than comparison group women. The small number of cases in our sample precludes any definitive answer.

Figure 3
Overall Publicly Funded Services Costs
AMONG CLIENTS IN FOUR AGE/GENDER COMBINATIONS
(Adjusted Costs Between Treatment and Comparison Groups in 12 Month Follow-Up Period)*





Note: The Treatment Group consists of 39% "gateway" clients; the Comparison Group has 29% "gateway" clients; overall 33% are "gateway" clients. Total costs include all income assistance, medical and treatment reentry costs. The before costs are for all ADATSA eligible clients: Treatment plus Comparison Groups. The after costs are the statistically adjusted costs during the follow-up period.

* The adjustment was made for the following significant factors: client age and gender, mental health problems, pregnancy at time of assessment, court prompted assessment and total assistance costs 12 months before treatment. For statistical details see the results of the statistical model in Figure 1, Appendix 6.

Clients 30 or Older

Overall, clients age 30 or over showed no cost avoidance.

This is true for both "gateway" clients and "non-gateway" clients.

This is probably due to the high rates of mental and physical problems uncovered both at the "gateway" and during treatment among these clients 30 older. High costs in general were found to be correlated with the following client characteristics:

mental/emotional problems, ever attempted suicide, recommended physical evaluation, physical problems, high prior medical costs, prior income assistance, living alone and low prior wages.

For women 30 and over the lack of cost avoidance may be due not only to the above factors, but also to their high rate of pregnancy (5.1 percent). They may be more likely to obtain perinatal services if treated.

COST AVOIDANCE AMONG GROUPS WITH DIFFERENT MENTAL HEALTH STATUS

Often, in this report, treatment outcomes were found to differ according to the mental health status of clients. Our earlier analyses have shown both an overall unique effect of treatment among all clients and a specific unique interaction effect of treatment with mental health status. Now we want to see the overall cost-avoidance impact of treatment among clients with and without these problems.

Major Mental Health Findings

The findings, in general, confirm the importance of mental health status in determining cost avoidance outcomes.

Clients with mental health problems have large cost increases after treatment, while clients without mental problems have substantial cost avoidance.

In particular, we found the following.

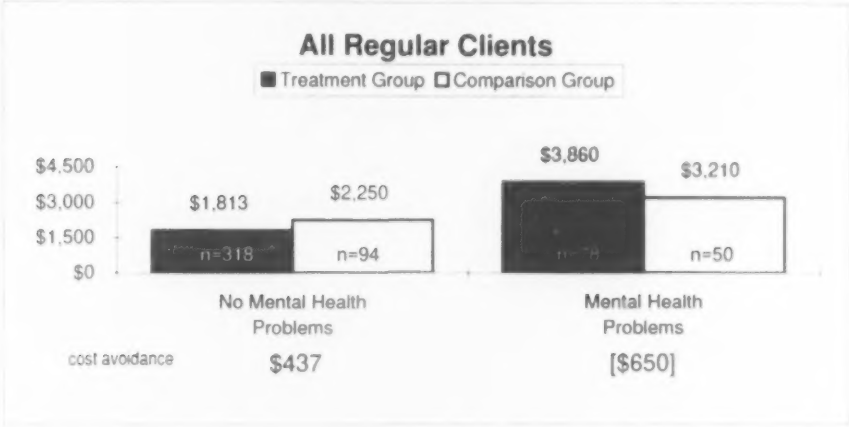
Clients With Mental Health Problems

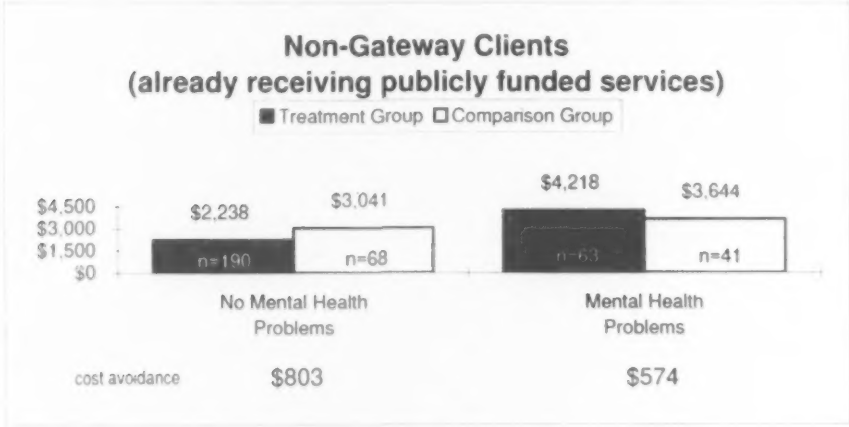
Substantial cost *increases* occurred among treated clients with mental health problems: $650 increase, overall.

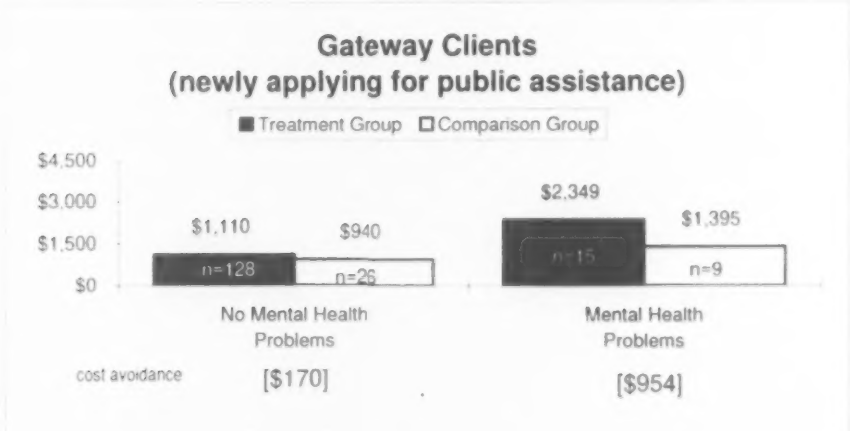
A very high cost increase was found among treated "gateway" clients with mental health problems: $954 increase. A substantial cost increase was found also among treated "non-gateway" clients with mental health problems: $574 increase. (See Figure 4)

Treatment may very well have been an opportunity for these clients to access other public services to meet their needs, whether they were new to the welfare system or not.

Figure 4
Overall Publicly Funded Services Costs
AMONG CLIENTS WITH AND WITHOUT MENTAL HEALTH PROBLEMS
(Adjusted Costs Between Treatment and Comparison Groups in the 12 Month Follow-Up Period)*







Note: The Treatment Group consists of 39% "gateway" clients, the Comparison Group as 29% "gateway" clients, overall 33% are "gateway" clients. Total costs include all income assistance, medical and treatment re-entry costs. The before costs are for all ADATSA eligible clients: Treatment plus comparison Groups. The after costs are the statistically adjusted costs during the follow-up period.

*The adjustment was made for the following significant factors: client age and gender, mental health problems, pregnancy at time of assessment, court prompted assessment and total assistance costs 12 months before treatment. For statistical details see the results of the statistical model in Figure 1, Appendix 6.

Clients Without Mental Health Problems

A substantial amount of cost-avoidance was obtained among the large group of treated clients without mental health problems: $437 of costs avoided, overall.

This was entirely due to the much lower costs among treated "non-gateway" clients: about $800 of costs avoided. No cost avoidance was found among treated "gateway" clients. They actually showed a slight cost increase, possibly related to the greater outpatient re-entry costs noted earlier.

COST AVOIDANCE RATES

Cost Effectiveness of ADATSA Treatment in Avoiding Further Costs

We will now quantify the cost effectiveness of treatment from the perspective of avoiding direct costs to public service agencies. We do so by comparing the total costs avoided with total treatment costs expended. This is expressed as the cost avoidance rate: the amount of cost avoided by the average client as a percentage of the amount the ADATSA program expended for treatment for the same client.

Limitations

There are two limitations of this analysis: one related to the length of the follow-up period, the other to the fact that types of treatment are not differentiated.

- The cost avoidance rate obtained depicts the costs avoided only during the first year after treatment. It is not known whether more or less costs will be avoided in subsequent years.
- The cost avoidance rate of treatment refers to any ADATSA funded treatment. We have had to combine all different types of treatment modalities and lengths. This is due to the lack of sufficient sample size to make distinctions in types and lengths of treatment, i.e. treatment paths, which have different costs.

Advantages

The advantages of this analysis using cost avoidance rates are twofold.

- It allows us to *gauge the relative magnitude of costs avoided in terms of the actual costs of ADATSA treatment.*
- It also permits us to *compare the costs avoided among different subgroups of clients controlling for different costs of ADATSA treatment among the subgroups.*

Figure 5

FIRST YEAR COST AVOIDANCE RATES

Overall Publicly Funded Services Costs Avoided Relative to the Cost of ADATSA Treatment Among Major Groups of Regular Clients*

		Per Client Costs Avoided in 12 Months Follow-Up	ADATSA Treatment Costs Per Client	First Year Cost Avoidance Ratio
All Regular Clients*	Average Client	$222	$1,980	11% **
Gateway Effect	"Gateway" Clients (newly applied for publicly funded services) (33%)	[$314]	$1,980	[16%]
	Non-Gateway Clients - Already on Publicly Funded Services (67%)	$491	$2,314	21%
Age/Gender Subgroups	Men < 30 Years (25%)	$668	$1,980	34%
	Women <30 Years (33%)	$896	$1,980	45%
	Men 30+ Years (17%)	$41	$1,980	2% ns
	Women 30+ Years (17%)	[$590]	$1,980	[30%]
Mental Health Subgroups	Without Mental Health Problems	$437	$1,980	22%
	With Mental Health Problems (24%)	[$650]	$1,739	[37%]
Non-Gateway / Mental Health Effect	Non-Gateway Clients without Mental Health Problems (48%)	$993	$2,263	36%

* "Regular" Clients are those who do not receive AFDC or SSI and/or were not felony offenders.

NOTE: The overall adjusted cost avoidance results for each subgroup were generated by adding all the adjusted cost components: income assistance, medical assistance and re-entry costs avoided. The interested reader can obtain a handout with all relevant values and procedures from the authors.

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Cost of ADATSA Treatment

The summary results are as follows.

The average treatment cost per client in the ADATSA program is $2,002 in this study period.

Treatment costs ranged from a low of $1,632 among men less than age 30 to a high of $2,241 among men age 30 or over. (See Figure 5).

These treatment costs included detoxification, inpatient and outpatient treatment costs, plus whatever monthly stipends the clients received as "income assistance grants" while in outpatient treatment. The ADATSA treatment period started after assessment in the fall of 1989 and ended the end of the month in which treatment itself ended. Almost all ended before June 30, 1990.

Overall Cost Avoidance Rate

Our best estimate of the first year cost avoidance rate for the average client is 11 percent. However this rate is based on a non-statistically significant cost avoidance amount.

This overall rate is low because of the "gateway" effect among the one third of all clients who entered the "publicly funded services system" for the first time. "Gateway" clients who obtained treatment incurred higher costs the first year after treatment: 17 percent higher than their costs of ADATSA treatment.

Rate Among Clients Already on Publicly Funded Services

Among "non-gateway" (those clients already receiving publicly funded services), ADATSA treatment is followed by a substantial 23 percent cost avoidance rate.

This may better represent the overall effect of treatment on cost avoidance. However, from year to year the "gateway" effect generates real cost increases to public agencies and cannot be ignored.

Other important differences in cost avoidance rates exist among subgroups of clients. These differences exist even if we do not separate "gateway" and "non-gateway" clients in our rate calculations.

Rates Among Age/Gender Subgroups

- **Men and women less than 30 years old have very high cost avoidance rates of 50 percent and 44 percent, respectively.** They show that public service agencies would "recover" the amount expended for these clients' treatment in about two years, if the first year rates persist through the second year.

  These younger clients constitute 36 percent of all clients.

- Men age 30 or over have no significant cost avoidance rate: a 2 percent estimated rate.
  They constitute 47 percent of all clients.

- Women age 30 or over have a cost rate increase: an increase of 19 percent over treatment expenses.

  They are a small minority of clients: 17 percent.

Rates Among Clients With Different Mental Health Status

- Clients with mental health problems had a substantial cost rate increase: 37 percent increase in costs over treatment expenses.
  They constitute 24 percent of all clients.

- Clients without mental health problems have a 21 percent cost avoidance rate.

  Seventy six percent of all clients did not have mental health problems.

This indicates that ADATSA treatment is substantially cost effective in reducing public service costs among a large majority of its clients: 76 percent of all clients. The cost "recovery" period is about five years, assuming equal rates over time.

High Cost Avoidance Rates Among Half of All Clients

If we exclude clients with mental health problems, who clearly have needs beyond what ADATSA is able to satisfy, *and* clients experiencing the "gateway" effect, the cost avoidance rate of ADATSA treatment increases appreciably.

- Clients without mental health problems, who were already receiving publicly funded services, have a 36 percent cost avoidance rate.

  They constitute 48 percent of ADATSA clients.

  For this half of all ADATSA clients, the cost "recovery" period is quite short: less than three years.

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DISCUSSION

Discussion of Overall Results.

In general, the findings suggest a favorable overall impact of treatment on cost avoidance when the confounding "gateway" effect is eliminated. This positive overall impact was largely due to much lower costs found among younger clients and among clients without mental health problems.

The type of public services for which costs were avoided was medical costs in the immediate follow-up period, probably due to improvements in general health among treated clients. These favorable results emerge in spite of increased medical needs of some women due to their pregnancy, and the higher costs incurred by clients with mental health problems.

The overall impact among clients already on assistance before treatment was substantial. The first year cost avoidance rate was 23 percent. This 23 percent rate indicates a "recovery" period of about four years, assuming the same cost avoidance rate over time.

The cost avoidance rate may in fact improve over time if other costs decrease as recovering clients further improve their general health and need less outpatient medical services. The aftercare support provided by outpatient treatment services may also decrease as clients obtain other informal support.

It is left to speculation whether a longer follow-up period would show large decreases in costs of other types of assistance other than inpatient medical services. As already mentioned, there are reasons to believe that outpatient medical and aftercare needs may decrease with successful recovery. However, it is doubtful whether time would ameliorate the physical and/or mental incapacities which make clients eligible for income assistance. Clearly, to obtain a true picture of long term cost avoidance amounts, rates and recovery periods, a longer follow-up is needed.

Discussion of Subgroup Results

The subgroup results point to ADATSA successes among younger clients, particularly younger men, and among mentally healthy clients, in terms of cost avoidance in this chapter and in terms of employment in previous chapters. Current results on cost avoidance also show the limitations of ADATSA treatment, as currently structured and funded, to deal "cost effectively" with older clients and those with more serious mental health problems.

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The calculations of the first year cost avoidance rates show most clearly the differential cost effectiveness of ADATSA treatment depending on the age/gender characteristics and mental health status of clients. Cost avoidance rates varied from a positive 50 percent rate to a negative 37 percent rate, which indicates a high cost increase. These subgroup differences were also found when analyzing the employment outcomes of treatment in the second chapter. It is, therefore, important to discuss the implications of these differences, subgroup by subgroup.

The Issue of Mental Health.

We found, as expected, that clients with mental health problems cost more after treatment. They had a substantial cost rate increase of 37 percent the first year after treatment. This is not surprising in light of other research findings on treatment outcomes of more middle class clients. Our earlier reported summary of the state of knowledge about drug treatment effectiveness includes "low level of psychiatric functioning" as predicting poorer outcomes in most programs.

As mentioned before, there is a lack of sufficient ADATSA funding of inpatient programs appropriate for clients who are also mentally impaired. They also may need more services irrespective of treatment outcomes. These factors may not allow ADATSA treatment to be equally cost effective for these clients, as it is for clients without mental health problems.

The Issue of Older Age.

Our findings on the effects of age differ from those reported in the research literature on the effectiveness of drug treatment. In this literature, demographics of clients were not found to be highly related to outcomes.

Among indigent addicts in this study older age may be associated with a much longer and serious history of drug use, a much longer period of unemployment, and worse physical health than among better off, private pay clients. These characteristics are, in fact, likely to be the factors leading to indigence.

Furthermore, vocational and other life skills may also be totally lacking. Relatively brief chemical dependency treatment, however intense it may be, may not be able to remedy the lack of these necessary skills.

The end results is that treatment may lead to more abstinence, but not to jobs, private health insurance and better health. Since the major source of cost avoidance is lower medical health expenses, ADATSA treatment may not be able to achieve cost avoidance among older clients, at least in the first year after treatment.

General Implications

The findings, however favorable overall, suggest investigating the desirability of ADATSA targeting different groups of clients with different types and lengths of treatment and different expected treatment outcomes. The program, as currently structured by legislative regulations, does not easily permit tailoring treatment to meet individual client needs or different group needs. Our findings suggest the need to do so. If this is not done, then the costs avoided by younger and/or mentally healthy clients may continue to pay for the higher follow-up costs of older and/or mentally impaired clients. It may be cost effective to spend more 'up-front' in better-tailored, longer treatment, with special vocational services for targeted older or mentally impaired clients. For others, too incapacitated physically and/or mentally, cost effectiveness considerations suggest foregoing treatment for a revised ADATSA 'shelter' program and/or a case management program (see Gary Cox"s ongoing Study of Intensive Case Management for Chronic Public Inebriates, at the University of Washington, Department of Psychiatry and Behavioral Sciences, Seattle, Washington).

SPECIAL GROUPS OF ADATSA CLIENTS: AFDC RECIPIENTS, FELONY OFFENDERS, CLIENTS WHO DIED

7

In the previous analyses of employment outcomes and cost avoidance, we have excluded certain special groups of clients. Their characteristics suggested differences in the likelihood of their employment and in their expected publicly funded services costs.

In this chapter, we examine the background characteristics of AFDC recipients and felony offenders, and we report on the testing of the expected different treatment outcomes among these clients. For the clients who died, we tentatively estimate the mortality rate among ADATSA clients and explore whether treatment lowers the risk of mortality in the follow-up period.

Chapter Organization

The chapter is divided into three sections.

Section 1

First, we examine the *recipients of Aid to Families with Dependent Children (AFDC),* who constituted 18 percent of the clients studied.

- The major differences in their background characteristics are compared to those of regular clients.
- The different expectations in treatment outcomes are explained.
- The tentative findings are presented regarding employment outcomes and cost avoidance results of treatment.

Section 2

Second, we consider *clients who were recently convicted of felony offenses:* 16 percent of the clients studied.

- A brief overview of their background characteristics is presented.
- The probable different outcomes of treatment are discussed.
- An exploratory study of treatment outcomes is described regarding employment, publicly funded services costs and further confinement costs.

Section 3

Third, we examine in some detail the *clients who died.* We calculate the mortality rates for different groups of clients: the regular ADATSA clients, AFDC recipients and felony offenders.

- We compare these mortality rates to those of the general population of the same age and gender.
- Finally, we examine whether the mortality among Treatment Group clients is lower than that of comparison group clients.

Unfortunately, the other special group, the recipients of physical disability grants (SSI), is too small to describe separately (a total of five SSI recipients, less than 1 percent of the clients studied).

SECTION 1: RECIPIENTS OF AID TO FAMILIES WITH DEPENDENT CHILDREN

Background Characteristics of AFDC Recipients

Background Characteristics of AFDC Recipients

In order to examine possible differences in client profiles, the characteristics of AFDC clients were compared to those of regular ADATSA clients and to the overall characteristics of all ADATSA eligible clients.

General Profile

The AFDC recipients were mainly women, younger, healthier, with shorter histories of substance abuse and fewer treatment episodes. They were more often pregnant and married, and almost all were on assistance before being assessed for chemical dependency. Their degree of prior work experience was unexpectedly high: as high as that of regular clients. Also unexpected is their degree of recent involvement with the criminal justice system: higher than that of regular clients. (See Figure 1.)

Detailed Characteristics

AFDC recipients were found to be mainly younger women, with fewer years of substance use and fewer episodes of prior treatment. Fewer AFDC recipients had physical or mental health problems, probably due to their younger ages. Fewer were living on the street or in a shelter at the time of assessment.

One third of the women were pregnant. Pregnant women among AFDC recipients constituted 78% of all ADATSA women who were pregnant.

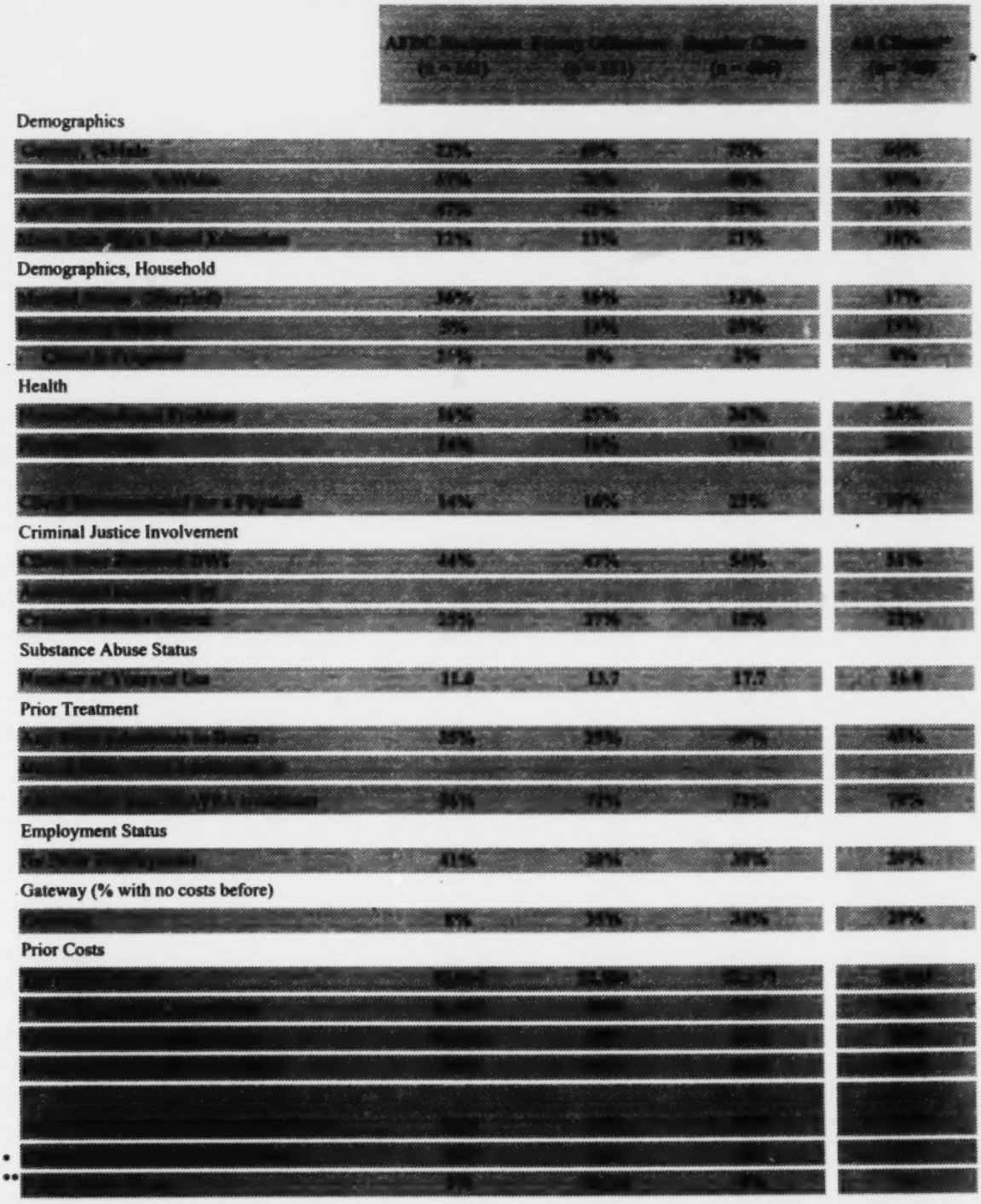
More AFDC recipients were married: one out of three compared to one out of eight among regular clients. This is partly due to the presence in this group of two person (husband-wife) AFDC recipients, estimated to be one in five of all AFDC recipients.

Almost all (92 percent) were receiving some publicly funded services twelve months prior to chemical dependency assessment. The average publicly funded service costs incurred before assessment were, therefore, much higher among AFDC recipients than among regular clients. The highest costs were for income assistance and medical assistance. These costs were about twice those of regular ADATSA clients.

The proportion of AFDC recipients who had some employment the year before was surprisingly similar to that of other ADATSA clients: 41 percent compared to 39 percent. Their recent work experience seemed to be no more nor less than that of other ADATSA clients.

Another unexpected finding was the high degree of recent criminal justice involvement among AFDC recipients: one out of four had court prompted assessments. This compared to about one out of six among

Figure 1
BACKGROUND CHARACTERISTICS
Of Clients Who Were Eligible for ADATSA Treatment
Who Were also AFDC Recipients, Felony Offenders or Regular Clients*
(Treatment and Comparison Groups Have Been Combined Within Each Group)



NOTE: Sample sizes shown represent cases with no missing values on background characteristics and are weighted so as to be representative of the population.

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Detailed Characteristics (cont.)

regular clients. These were not assessments connected to felony offenses. The few AFDC clients who committed felonies have been excluded from this group and included in the special group of felony offenders.

A possible explanation for the unexpected number of court prompted assessments may be the involvement of AFDC clients in cases of child abuse and neglect. These often prompt court action and often legally require ADATSA assessments if substance abuse is suspected. A recent finding seems to support this explanation. "Nearly one third of infants born to Medicaid women who were substance abusers were reported as child protective service cases before their second birthday." (See Laurie Cawthon, 1993.) Further research is needed to see whether this is true statewide and, in particular, among ADATSA clients who are AFDC recipients.

Different Outcome Expectations for Treatment Among AFDC Recipients

Employment Outcomes

Evaluation studies of the Family Independence Program (FIP) showed relatively poor success for that program's efforts to increase the rate of employment among AFDC recipients (See Longhi et. al., 1993: 51-54, 126-127). FIP provided services targeted specifically at increasing employment, while ADATSA's primary objective was, and still is, recovery from chemical dependency. Because of this, we had low expectations regarding the likelihood that treatment would raise employment rates among AFDC recipients. To expect higher employment rates among these clients, who still had dependent children while recovering from chemical dependency, seemed unrealistic.

Cost Avoidance Outcomes

Similarly, our expectations regarding the possible cost avoidance effects of treatment were not high for these clients. AFDC parents, one third expecting a new child, were eligible for continued income and medical assistance after treatment as long as they had dependent children and were indigent. This was true irrespective of their success in recovering from chemical dependency. So we expected that most AFDC parents would continue receiving assistance even if treated.

Different Outcomes

The fact that, by definition, AFDC recipients are responsible for dependent children suggests that one of the primary outcomes of chemical dependency treatment should be the better health and care of their children. The prevalence of child neglect and abuse among AFDC families with substance abuse problems suggests that an investigation of whether treatment affects such outcomes may be very important. It may be more important than an investigation of more employment or short term cost avoidance effects of treatment among AFDC recipients.

However, the intent of this study was to examine only the employment and cost assistance outcomes of treatment. Therefore, we extended only these outcome analyses to AFDC recipients.

Employment Outcomes of Treatment Among AFDC Recipients

Overall Findings

AFDC recipients who received ADATSA treatment are significantly more likely than clients who were assessed but did not receive ADATSA treatment to be substantively-continuously employed and to have higher earnings in the post-treatment period.

Substantive Employment

- **Overall, AFDC clients in the Treatment Group were significantly more likely to be substantively-continuously employed in the post-treatment period than AFDC clients in the Comparison Group (17% vs. 4%). (See Figure 2 and significant main effect of treatment in Figure 1, Appendix 7.)**
- **ADATSA clients who were AFDC recipients reached the same ratio of substantive employment post-treatment as regular ADATSA clients, after controlling for the effects of other background factors.**

The only background factor significantly related to substantive employment in the post-treatment period was some prior employment in the twelve months prior to assessment. AFDC recipients in both the Treatment Group and the Comparison Groups were approximately three times as likely to be substantively-continuously employed post-treatment if they had employment in the twelve months prior to assessment.

Earnings

- **The AFDC clients in the Treatment Group had significantly higher average monthly earnings than the AFDC clients who were assessed but did not receive ADATSA treatment ($200 vs. $77). (See Figure 3 and significant main effect of treatment in Figure 1, Appendix 7.)**
- **However, these earnings were lower on the average, than those of regular ADATSA clients. (See Figure 3.)**

Among AFDC clients with high employment prospects (in this case, those with employment in the twelve months prior to assessment, male and no mental health problems), the predicted average earnings for the Treatment Group was $263 vs. $140 for the Comparison Group.

Caution

The number of AFDC clients in our sample for these analyses was small—161. Few client background variables were significantly related to employment outcomes. This may affect the adequacy of our statistical adjustments. Therefore, these results should be interpreted with caution.

Note on Any Employment: AFDC recipients in the Treatment Group had the same or lower rate of any employment as those in the comparison Group. (See Figures 1 and 2 in Appendix 7).

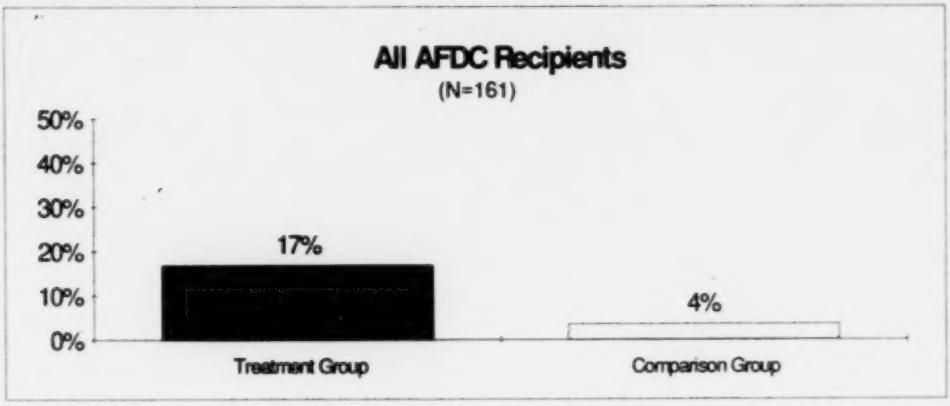
Figure 2

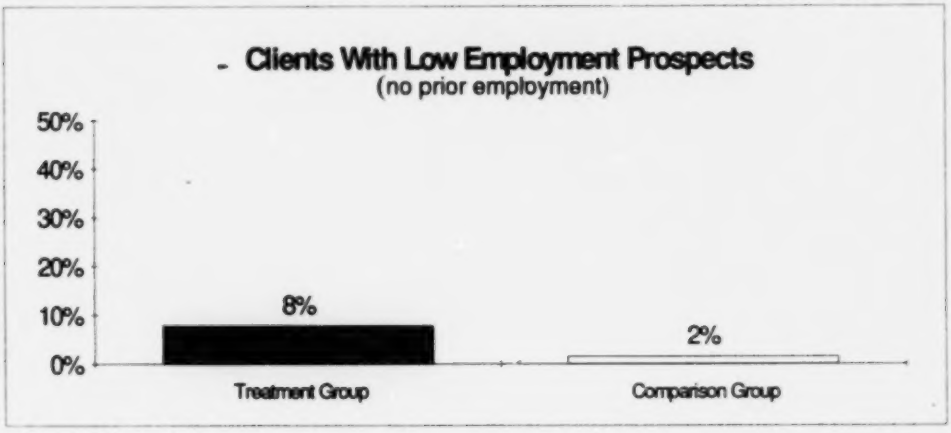
RATES OF ACHIEVING SUBSTANTIVE-CONTINUOUS EMPLOYMENT

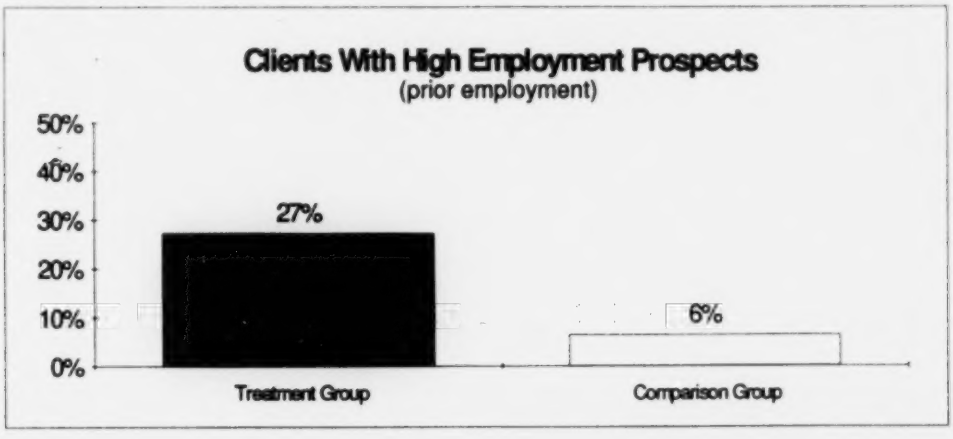
After Treatment

For Recipients of Aid to Families With Dependent Children (AFDC)

(Adjusted Rates Between Treatment and Comparison Groups in the 18 Month Follow-Up Period)*

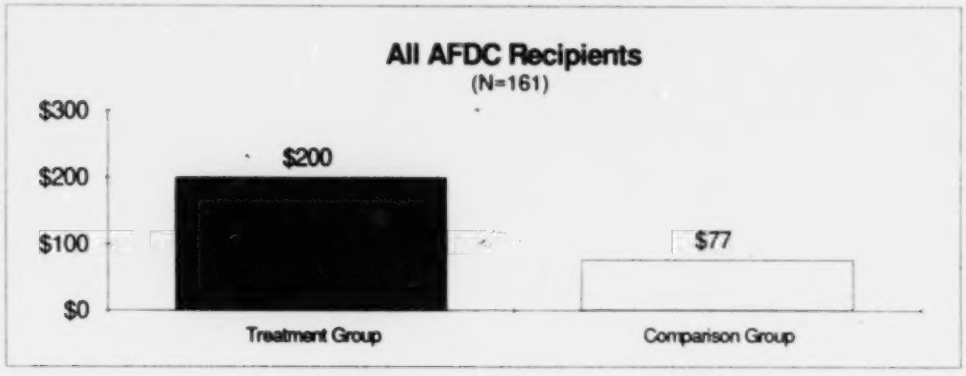


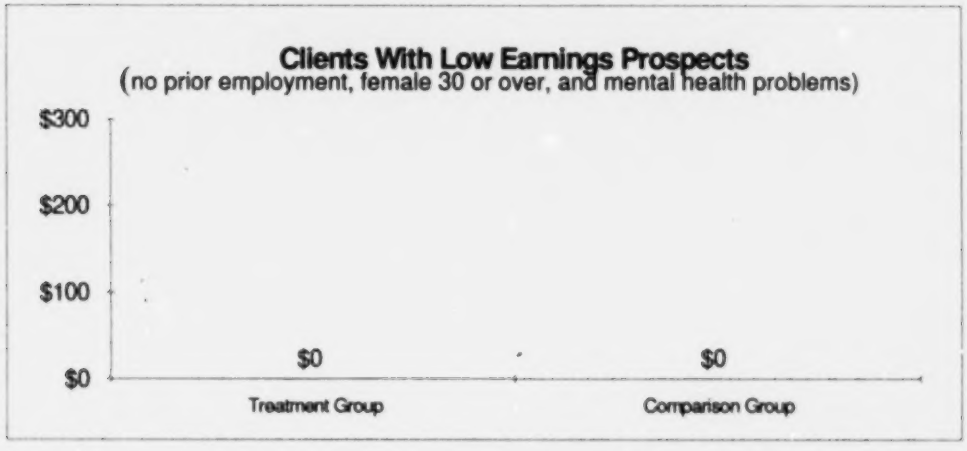


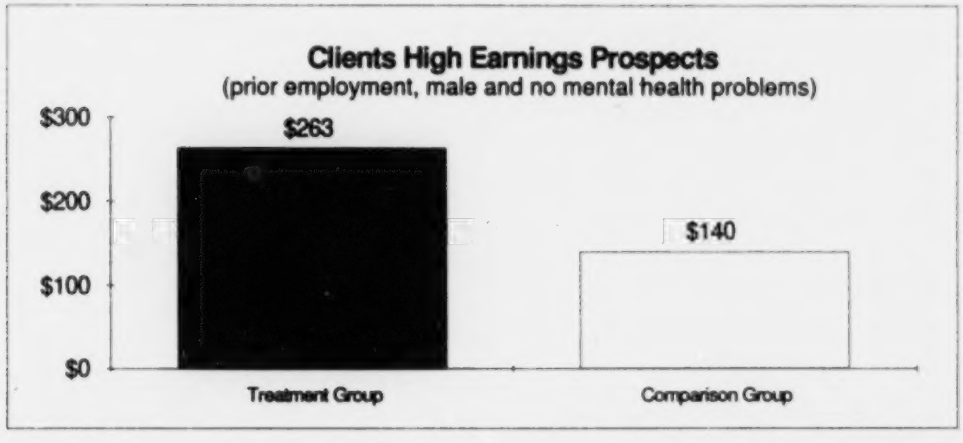


* Rates have been tentatively adjusted for differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for factors affecting earnings in the follow-up period. (See the results of the logistic regression, Figure 1 Appendix 7.)

Figure 3
AVERAGE MONTHLY EARNINGS
After Treatment
For Recipients of Aid to Families With Dependent Children (AFDC)
(Adjusted Earnings Between Treatment and Comparison Groups in the 18 Month Follow-Up)







* Earnings have been tentatively adjusted for differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for some factors affecting earnings in the follow-up period. (See the results of the least squares regression, Figure 1, Appendix 7.)

Cost Avoidance Outcomes of Treatment Among AFDC Recipients

Overall Costs

Using very tentative analyses and adjustments due to the small sample of cases available we found the following:

- **Overall, among AFDC recipients, Treatment and Comparison Group clients seem to have similar total costs in the follow-up period. There was a non-significant cost avoidance of only $67. (See Figure 4.)**
- **Our tentatively adjusted data showed that this similarity is a result of lower costs among some clients and higher costs among others in the same Treatment Group.**
  - ***The lower costs are for treated clients who were not pregnant and who were without mental health problems.*** **These lower costs produced an estimated cost avoidance of $685 per client among the 70 percent of all AFDC recipients who were not pregnant and had no mental health problems. (See Figure 4.)**
  - ***The higher costs are for clients with mental health problems and/or clients who were pregnant at the time of assessment.*** **These higher costs gave rise to an estimated $1,116 cost increase per client among the 30 percent of all AFDC recipients who were pregnant or had mental health problems. (See Figure 4.)**

Income and Medical Assistance Costs

These overall findings, though based on tentative adjustments, are supported by the analysis of the types of publicly funded service costs avoided.

- **Among AFDC recipients, Treatment Group clients who were not pregnant and who were without mental health problems had lower income assistance and lower medical assistance costs.**

  The income assistance finding suggests that Treatment Group clients with the above characteristics were on AFDC assistance for a shorter time than the same type of clients in the Comparison Group. The medical assistance finding suggests that ADATSA treatment may have decreased their further need for medical services. (Figure 4, bottom panel.)

- **Almost opposite findings emerged for Treatment Group clients who were pregnant and/or had mental health problems.** Among these clients, income assistance costs were the same in the follow-up period as those of Comparison Group clients. Medical costs were higher than those of Comparison Group clients. (See Figure 4, bottom panel.)

Figure 4
Tentative Estimates of Cost Avoidance or Increase Among ADATSA Clients Who Are AFDC Recipients
(Adjusted Publicly Funded Services Costs Between Treatment and Comparison Groups in 12 Month Follow-Up Period)*

Overall Cost Avoidance

	Costs in the 12 Month Follow-Up Period		
	Treatment Group	Comparison Group	Cost Avoidance (or Increase)
AFDC Clients with No Mental Problems and Not Pregnant	$3,651	$4,336	$685 (avoidance)
AFDC Clients With Mental Problems, Pregnant or Both	$4,928	$3,812	[$1116] (increase)
All AFDC Clients	$4,180	$4,167	$67 (avoidance)

Note: ADATSA Treatment Cost for AFDC Clients is $1,678.

Sources of Cost Avoidance or Increase

	Income Assistance	Inpatient Medical	Outpatient Medical	Inpatient Tx Re-Entry	Outpatient Tx Re-entry
AFDC Clients With No Mental Problems and Not Pregnant	some avoidance	not available**	some avoidance	no change	increase
AFDC Clients With Mental Problems, Pregnant, or Both	no change	not available**	increase	some avoidance	increase
All AFDC Clients	some avoidance	not available**	no change	some avoidance	increase

* Costs have been statistically adjusted for some differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for the same background characteristics which affected costs in the follow-up period among regular ADATSA clients. (See adjustment notes for results presented in Chapters 4,5, and 6.) Because of the small number of cases, all likely differences could not be detected as statistically significant. Therefore, the reported adjusted costs are at best tentative. (See Figure 3 in Appendix 7 for details.)

** The adjusted result for inpatient medical costs is not available because the statistical model used failed to provide any statistically significant results. See Figure 3 in Appendix 7 for the unadjusted inpatient medical costs.

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Treatment Re-entry Costs

Concerning treatment re-entry costs, the findings for AFDC recipients are almost the same as those for regular ADATSA clients.

- **AFDC clients in the Treatment Group had lower costs for re-entry into inpatient/detox treatment, higher costs for re-entry into outpatient programs.**

  The lower use of inpatient treatment suggests less relapse among treated clients. The higher use of outpatient treatment supports the interpretation of continued need for aftercare services not only among regular ADATSA clients, but also among AFDC recipients. (See Figure 4, bottom panel.)

Summary and Discussion

AFDC Recipients

We found, as expected, that the client profiles of AFDC recipients are quite different than those of regular ADATSA clients: mainly women, younger, healthier, and a large proportion of women pregnant at the time of assessment.

While the data collected for this study did not permit us to test whether treatment had the effect of improving the care and health of the dependent children of AFDC recipients, a major goal of treatment for these clients, we could test their employment and cost avoidance outcomes.

Unexpected Employment Results

We were pleasantly surprised to find significant effects of treatment in increasing the likelihood of both substantive-continuous employment and earnings. Even though the rates of employment and average earnings achieved by treated AFDC recipients were not as high as those of the most successful regular clients, particularly younger men, the apparent effectiveness of ADATSA treatment in improving employment prospects for this special group of clients is an important and unexpected finding.

Unexpected Cost Avoidance Results

The other unexpected result was the cost avoidance effect of treatment found among non-pregnant AFDC recipients with no identified mental health problem. These clients constituted 70 percent of all AFDC recipients. The findings suggest that treatment may shorten their continued reliance on AFDC assistance and may decrease their medical expenses by improving the health of the clients and their children.

The overall publicly funded service costs in the follow-up period among AFDC recipients who had mental problems or who were pregnant were much higher if treated. This is probably explained by their higher need for publicly funded services and their better access to services if treated.

Statistical Cautions But Consistent Patterns of Results

We need to remember once again that the statistical basis for all the above findings is rather weak due to the small number of cases. However, the consistent patterns of results provide some confidence in their representing true trends. Among AFDC recipients as well as for regular ADATSA clients, we found higher publicly funded services costs among pregnant women and among clients with mental health problems. We also found similar patterns of costs for re-entry into treatment.

Our intent here is to point to the very interesting and unexpected results of treatment among AFDC recipients, however tentative they may be. At the same time, we argue for the need of further studies with larger sample sizes to confirm these results.

Section 2: CLIENTS WHO WERE RECENTLY CONVICTED OF FELONY OFFENSES

Background Characteristics of Felony Offenders

General Profile

Overall, ADATSA clients who were convicted of felony offenses during the year prior to treatment were very similar to regular ADATSA clients on most characteristics. The biggest difference was that twice as many had court prompted assessments. (See Figure 1, page 91.)

Detailed Characteristics: *Differences*

The detailed differences and similarities are outlined below.

- Slightly more felony offenders were younger and white, and they had fewer years of alcohol or drug use.
- They were less apt to live on the street or in shelters, and slightly fewer had physical problems.
- They had slightly less formal education.
- One out of four women offenders was pregnant, compared to one out of twelve among regular clients. This is mainly due to our inclusion of AFDC clients who committed felony offenses in this group.

Detailed Characteristics: *Similarities*

- The same proportion had one or more prior treatment episodes.
- About the same proportion were married.
- One out of four, like regular clients, had mental health problems.
- The degree of prior work experience and the average amount of prior publicly funded services were remarkably similar.
- Even the pattern of publicly funded services costs across programs (income, medical assistance and re-entry) was very similar.

Different Outcome Expectations for Treatment Among Felony Offenders

Employment Outcomes

The double handicap of being both a recovering drug addict or alcoholic and an ex-convict was expected to decrease the likelihood of employment in the follow-up period. Both of these characteristics are usually flagged as high risk factors in terms of productivity and longevity in the work place. Since employers often prefer to minimize risks, our expectation was that chemical dependency treatment alone might not increase the likelihood of employment among ADATSA clients who were also felony offenders.

Publicly Funded Services Costs

The lower expectation for employment was, in turn, also expected to result in the continuation of publicly funded services costs after treatment at a level similar to that in the pre-treatment period.

Confinement Costs

In the long run, average confinement costs for this group of clients were expected to remain the same. We expected that some clients would commit other offenses and get longer sentences and some would break the cycle of drugs and prison or jail. The net result would be no change in the average confinement costs for the group as a whole.

In the short run, we hoped to find substantial avoidance of confinement costs soon after treatment. This would occur while clients were recovering, receiving community supervision and/or receiving support from aftercare programs.

Employment Outcomes of Treatment Among Felony Offenders

Overall Trends

There was a consistent trend toward higher employment outcomes and earnings for felony offenders who completed all treatment compared to those who completed only some treatment.

However, no differences in employment outcomes and earnings between the Treatment Group and the Comparison Group were statistically significant. This was probably due to the small number of such clients in this study. (See Figure 4, in Appendix 7 for details.)

Substantive Employment

There was a trend for those felony offenders who completed all ADATSA treatment to have higher rates of substantive employment: 25% for treated completers versus 14% for those obtaining some treatment and 6% for Comparison Group clients.

However, these substantive employment differences did not reach statistical significance. This is probably due to the small number of clients in this study's sample: little more than a hundred.

The only client background factor significantly related to rates of substantive employment for felony offenders was a combination of more than high school education and no mental health problems. Seventy one percent of felony offenders with these characteristics were estimated to achieve substantive-continuous employment if they completed treatment.

Earnings

There was a trend for those felony offenders who completed all treatment to have higher average monthly earnings than those felony offenders who completed some, but not all, treatment:

$237 for treatment completers versus $158 for those having some treatment and $120 for comparison Group Clients. (See Figure 6.)

However, average monthly earnings did not differ in a statistically significant way between those in the Treatment Group and those in the Comparison Group.

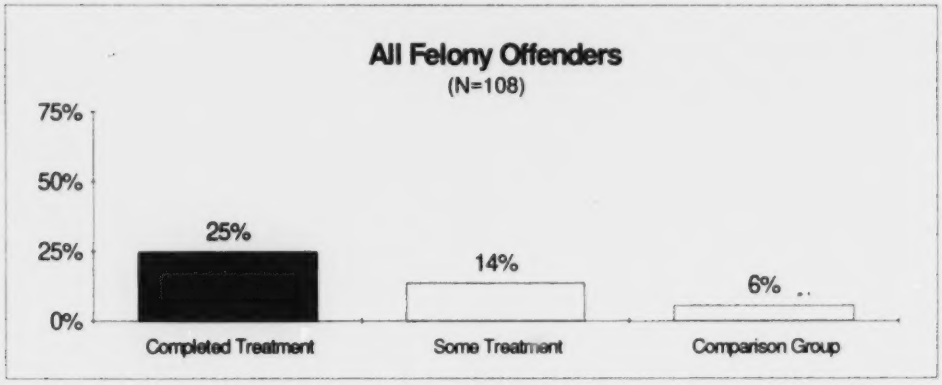
The only client background factor significantly related to higher average earnings for felony offenders was having more than a high school education. Felony offenders with a post-high school education were estimated to have average earnings of $411 after completing treatment.

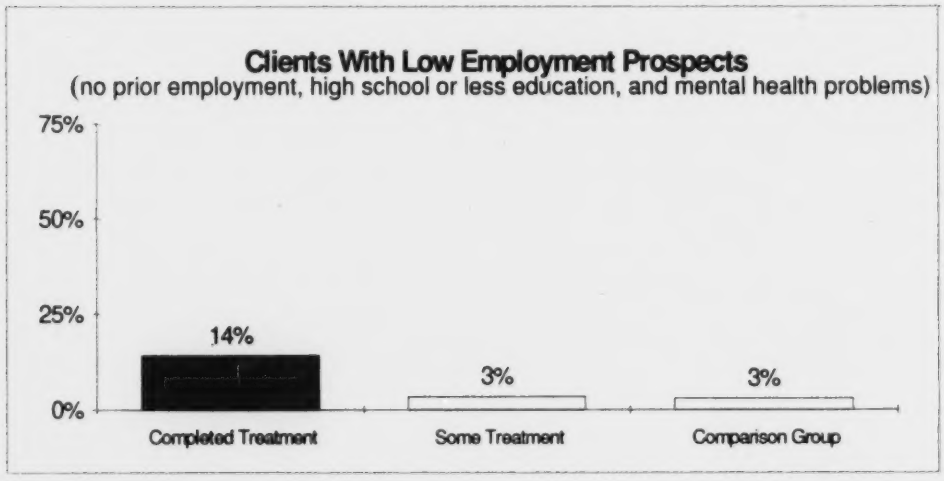
Caution

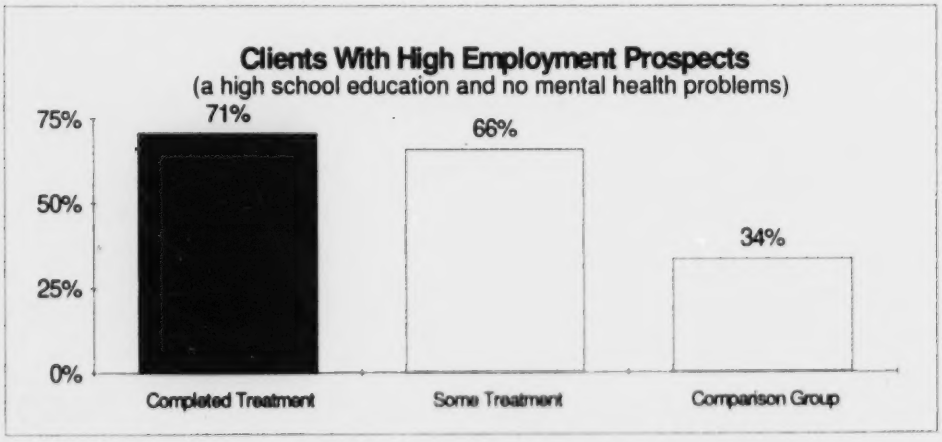
The number of felony offenders among ADATSA clients was proportionally high but constituted only a small sample of about 100 persons. Few variables were significantly related to employment outcomes. These results should be interpreted with caution as *trends* rather than as firm findings or precise estimates.

Note on Any Employment: The average felony offenders in the Treatment Group had the same or lower rates of any employment as those in the Comparison Group. (See Figure 4 and 5 in Appendix 7.) This indicates that treatment has no effect on higher job entry rates among these clients.

Figure 5
RATES OF ACHIEVING SUBSTANTIVE-CONTINUOUS EMPLOYMENT
After Treatment
For Felony Offenders
(Adjusted Rates Among Clients Completing Some, All or No Treatment
In the 18 Month Follow-Up Period)*

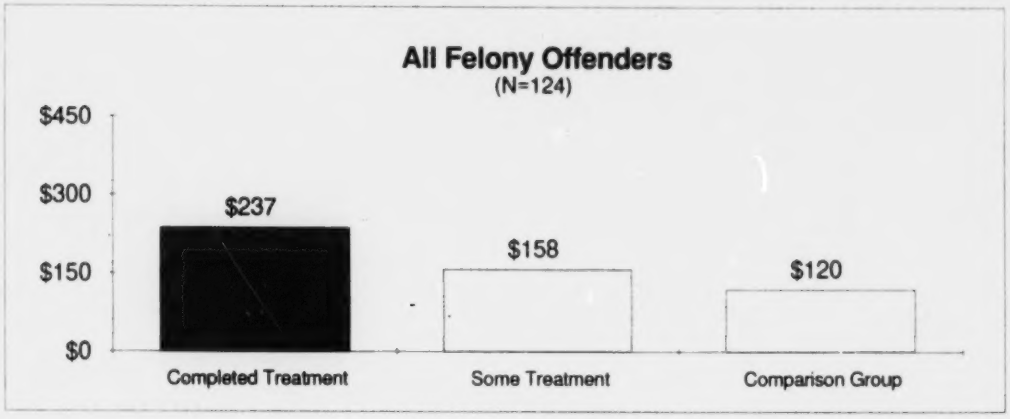


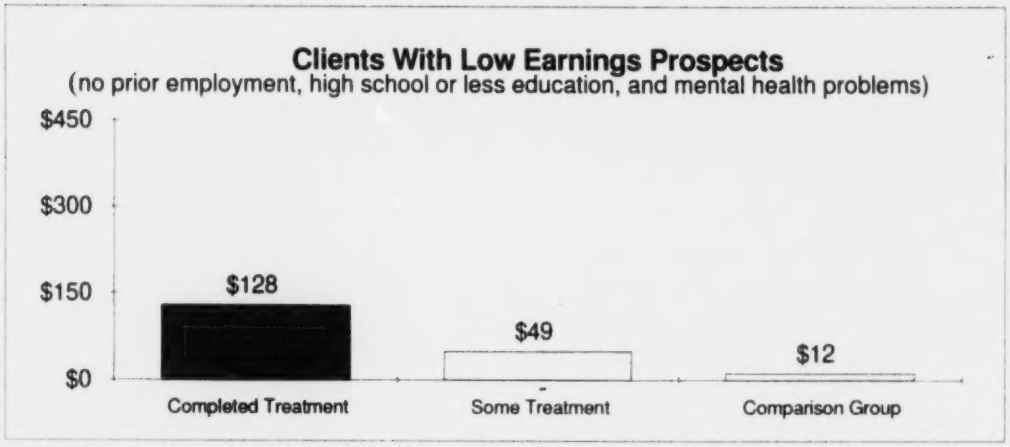


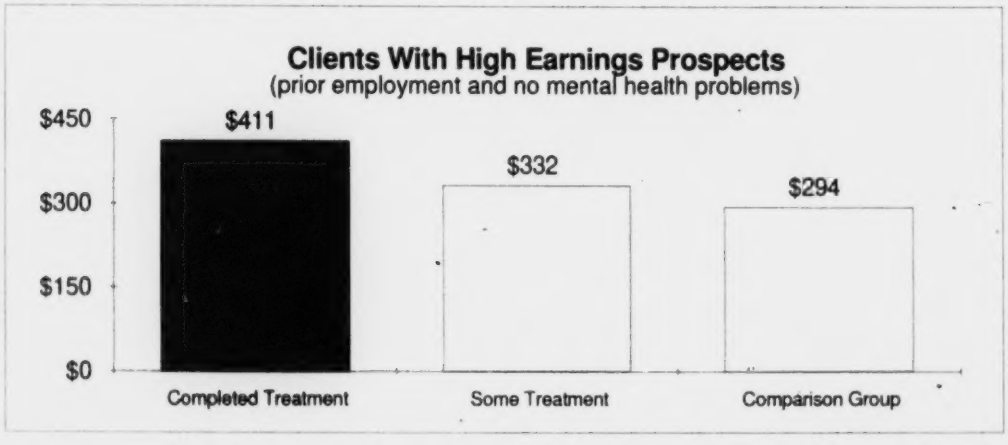


* Rates have been tentatively adjusted for differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for factors affecting earnings in the follow-up period. (See the results of the logistic regression Figure 4 Appendix 7.)

Figure 6
AVERAGE MONTHLY EARNINGS
After Treatment
for Felony Offenders
(Adjusted Rates Among Clients Completing Some, All or No Treatment in the 18 Month Follow-Up Period)*







* Rates have been tentatively adjusted for differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for factors affecting earnings in the follow-up period. (See the results of the least square regression Figure 4, Appendix 7.)

Cost Avoidance Outcomes of Treatment Among Felony Offenders

As already mentioned, we expected that ADATSA clients who were recently convicted of felony offenses would have the same or higher publicly funded services costs if treated. To the extent that clients remain indigent and unemployable, entitlement rules make a variety of public services available to them. Furthermore, community supervision was expected to increase the likelihood of clients actually using these services.

Trends in Overall Publicly Funded Services Costs

Our expectations are tentatively confirmed.

- **Among clients with recent felony offenses Treatment Group clients had higher publicly funded services costs than Comparison Group clients.**

  There was no cost avoidance effect for treatment, at least for the first 12 months after treatment. On the contrary, we tentatively estimated a rather substantial cost increase of $607 per client over the 12 month follow-up period. (See Figure 7.) A further study with a larger sample of clients is required to confirm the higher costs we tentatively found associated with ADATSA treatment.

- **Higher publicly funded services costs were found to occur among these clients, regardless of mental health status, age and gender.**

  Younger male clients with recent felony offenses actually had higher costs if treated. This is opposite to the lower costs found for treated younger males among regular ADATSA clients. (See the statistical model results in Appendix 7.)

Caution

The relatively small number of cases available did not permit statistically rigorous adjustments of costs. Our current estimates, therefore, are tentative. But the consistent pattern of estimated publicly funded services costs, adjusted in different ways across all types of assistance programs, provides the basis for some confidence in the general findings. (See Figure 7, bottom panel.)

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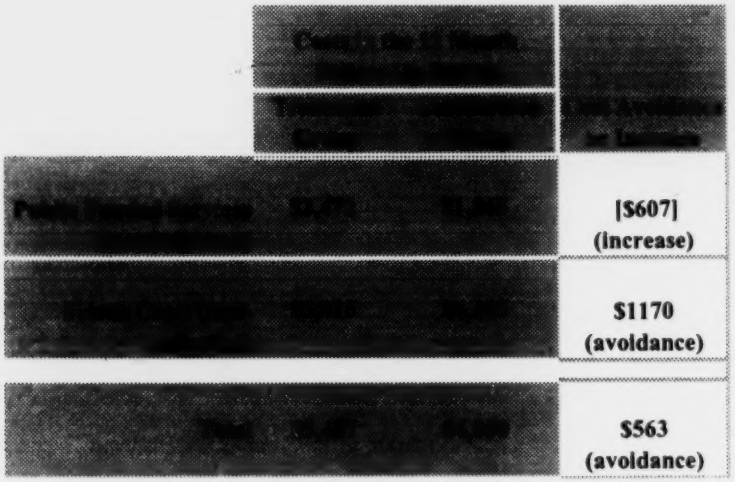
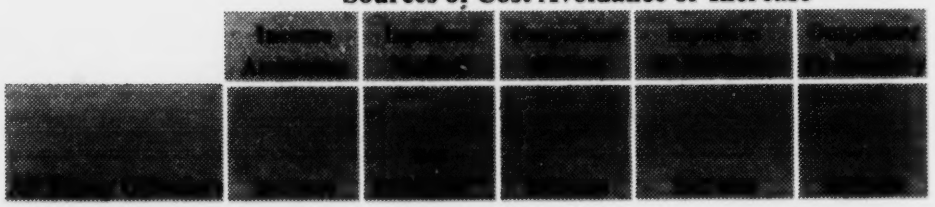
Figure 7
TENTATIVE ESTIMATES OF COST AVOIDANCE
Among ADATSA Clients Who Are Felony Offenders
(Adjusted Publicly Funded Services Costs between Treatment and Comparison Group in the 12 Month Follow-Up Period)*



Note: ADATSA Treatment Costs for Felony Offenders was $2,037.

Sources of Cost Avoidance or Increase



* Publicly Funded Services Costs have been statistically adjusted for some differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for the same background characteristics which affected costs in the follow-up period among regular ADATSA clients. (See adjustments notes for results presented in Chapters 4, 5, and 6.) Because of the small number of cases all likely differences could not be detected as statistically significant. Therefore the reported adjusted costs are at best tentative. (See Figure 6 in Appendix 7 for details.)

** The adjusted result for inpatient medical costs is not available because the statistical model used failed to provide any statistically significant results. See Figure 6 in Appendix 7 for the unadjusted inpatient medical costs.

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Trends in Income, Medical Assistance and Re-entry Costs

- **Costs for all types of publicly funded services (income assistance, medical assistance and re-entry into treatment) were higher for Treatment Group clients than for Comparison Group clients.**

This was true for all clients irrespective of age, gender and mental health status. Of interest is the statistically significant finding of higher re-entry costs into inpatient treatment for clients who were living on the streets or in shelters at the time of assessment. (See Figure 6 in Appendix 7.)

Unadjusted Confinement Costs

We expected lower short term costs confinement for treated clients to the extent that these clients were less likely to return to prison for further offenses or to jail for violations of conditions of community supervision.

- **The unadjusted confinement costs among felony offenders were much lower in the Treatment Group than the Comparison Group: $3,015 compared to $4,185 per client in the twelve month follow-up period resulting in a cost avoidance of $1,170. (See Figure 7.)**

This tentatively suggests a positive effect of treatment in reducing the likelihood of confinement for treated clients; i.e. treatment appears to be associated with lower recidivism. However, due to the small sample size statistical adjustments were not possible to verify the statistical significance of this finding.

Overall Cost Avoidance (Including Confinement Costs)

- **The cost *avoidance* in confinement costs ($1,170) was higher than the cost *increase* in other publicly funded services costs ($607). This tentatively suggests an *overall favorable cost avoidance effect* of treatment for felony offenders: $563. (See Figure 7.)**

Caution

The above estimates are very tentative due to the presence of non adjusted confinement costs and trends in the adjusted results.

Summary and Discussion

Unexpected Employment Outcomes

We had expected that clients with recent felony offenses would be burdened by a double handicap: the stigmas of having been both addicts and "convicts".

The unexpected finding was a trend for

- higher substantive-continuous employment rates and average earnings among clients who completed *all* treatment.

This finding suggests that completing treatment improves employment and earnings prospects regardless of the double handicap.

Results on Publicly Funded Services and Confinement Costs

The major expected treatment effects on costs for felony offenders in the 12 month follow-up period were:

- A higher level of publicly funded services costs,
- Lower confinement costs.

Both of these expectations were supported by the trends in our data.

Since the costs avoided for confinement were higher than the cost increases in publicly funded services, the net result was a tentative cost avoidance effect.

This net result on costs, combined with the positive employment outcomes of completing treatment, suggests that treatment may have an overall positive effect even among clients with recent felony offenses.

Cautions

The above findings need to be interpreted with great caution. They are based on trends for a small number of cases. The prison costs were not adjusted for possible differences in background characteristics between Treatment and Comparison Groups, because the sample size was too small to allow for rigorous statistical tests of the influence of these factors.

Moreover, in order for a study to obtain definitive conclusions the influence of background factors would have to be identified. Some clients may enter prison after treatment due to a prior offense, some because of a subsequent offense, and some for violation of the regulations imposed by community supervision. Some clients may start ADATSA treatment right out of prison, some much after. These different patterns would lead to different prison costs and different interpretations of the findings.

Further research with a much larger sample is needed to extricate these different patterns and to evaluate treatment outcomes. Based on our findings, it is fairly likely that this further research would identify positive treatment outcomes among some groups of felony offenders. This could provide an improved basis for targeting clients for treatment.

Section 3: CLIENTS WHO DIED

ADATSA clients who died during the 18 month follow-up period were excluded from all our prior analyses of outcomes: for regular ADATSA clients, AFDC recipients and felony offenders. This was done to avoid biasing the employment and cost avoidance results. However, death at an early age is one of the expected outcomes for some chemically dependent clients.

In this section, we estimate how high the mortality rate actually was among ADATSA clients in the follow-up period. We also explore whether there is evidence that clients in the Treatment Group had a lower mortality rate than Comparison Group clients. If this were true, it would suggest that treatment has the effect of improving the life expectancy of treated clients.

The mortality findings presented in this section are only tentative and exploratory due to the short follow-up time and the very small sample.

The Calculation and Interpretation of Mortality Rate Estimates

In 1990, the annual mortality rate for persons living in Washington State who were similar in age and gender to the ADATSA clients in this study was 206 per 100,000 or 0.2 percent. (The data were obtained from the Washington State Annual Summary of Vital Statistics, 1991). This would be the "expected" mortality rate among ADATSA clients *if they were like the general population in death rate.* Applying this rate to our sample of 765 ADATSA clients, we would have expected 1.58 deaths in twelve months or 2.36 deaths in the eighteen month follow-up period.

As may be obvious, there are problems of accuracy in deriving good estimates given such a low mortality rate. For example, two extra deaths would double the estimated mortality rate. Furthermore, only "whole" persons die so that there are additional errors due to rounding to "whole" people in any given estimate. The results presented below are, therefore, only suggestive and exploratory, indicating order of magnitude and trends, not firm estimates.

Overall Mortality Rates

In the eighteen month follow-up, 10 clients died, constituting a count of 11.74 clients in the weighted representative sample of all ADATSA clients. This death count indicated a yearly mortality rate of 1,023 per 100,000, for the first twelve months of the follow-up period. This rate was 5 times higher than the expected yearly rate of 206 per 100,000 for the general population of the same age and gender. In other words,

- **ADATSA clients were 5 times more likely to die in the 12 month follow-up period than persons in the general population of the same age and gender: one out of one hundred compared to one out of five hundred. (See Figure 8.)**

Causes of Death

- **The major causes of death were organ failures (42 percent) and suicides (17 percent). (See Figure 7, Appendix 7.)**

  Actually, four out of the ten observed deaths were suicides, but they constituted only 17 percent of the weighted representative sample of deaths. However, even this smaller percentage is 3 times the expected suicide rate in the general population of the same age and gender.

Death Related to Drugs

- **A disproportionate number of deaths were drug related: five out of the ten observed deaths, constituting 56 percent of the weighted representative sample of deaths.**

  The deaths that were not drug related were often due to organ failures among older clients. (See Figure 7 in Appendix 7.)

Timing of Deaths

- **Treatment Group deaths tended to occur some time after treatment, perhaps after relapse, while Comparison Group deaths tended to occur soon after the assessment for chemical dependency. (See Figure 7 in Appendix 7.)**

  We hypothesize that deaths among treated clients were related to relapse because of the higher percentage of drug related deaths, 71 percent, among these clients. The number of deaths occurring close to assessment among Comparison Group clients suggests that this period, often spent waiting for treatment, was quite traumatic for some clients: physically traumatic leading to organ failures, psychologically traumatic leading to suicide.

Mortality Rates Among Subgroups

The data also indicate that this higher mortality rate did *not* apply to all the ADATSA subpopulations examined. One group, in particular, had a much lower mortality rate than others.

AFDC Recipients

- **No deaths occurred in the eighteen month follow-up period among AFDC recipients. (Actually, none occurred in the 29 months from Aug. '89 to Dec. '91.)**

We knew that the "expected" mortality rate (i.e. the rate for that portion of the general population death rate which is of the same age and gender as the AFDC clients), would be lower for these clients.

The calculations yielded an expected mortality rate of 123 per 100,000 for AFDC recipients, instead of 206 per 100,000 for all ADATSA clients: almost half the expected death rate. This is due to the large proportion of younger women among AFDC recipients. Women, especially younger women, have much lower death rates than persons in general. Therefore, the number of deaths expected in one year among the 141 sampled AFDC recipients was only 0.17. **The fact that none died tentatively suggests that the mortality rate among AFDC recipients was similar to that of the general population of the same age and gender.**

- **Among regular clients and felony offenders death rates were found to be similar and high: 1,286 and 1,175 per 100,000, respectively, about 1.3 and 1.2 clients every one hundred clients per year. These rates are, respectively, 5.7 and 5.9 times higher than the general population of the same age and gender.**

Regular Clients and Felony Offenders

These much higher mortality rates are not surprising. The number of drug and alcohol related deaths in the general population are quite high (see Wickizer, 1993: Chapter 4). And many deaths among ADATSA clients are drug related (see the discussion in Appendix 7 regarding causes of death). However, the similarity in the mortality rates between regular clients and felony offenders was surprising. More violent deaths were expected among criminally involved clients but few occurred. A larger sample of such clients with a longer follow-up period of time is necessary to confirm these exploratory findings.

Mortality Rates for Treatment Group Clients Among Regular ADATSA Clients

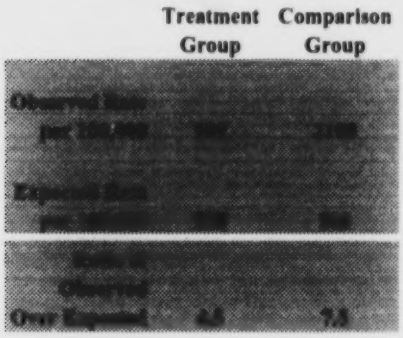
The only sample large enough to estimate the mortality rate separately for Treatment and Comparison Group clients was the sample of regular ADATSA clients.

- **Among regular clients, the Treatment Group had proportionally fewer deaths than the Comparison Group. The rates were 989 per 100,000 compared to 2,100 per 100,000. Treated clients were 4.5 times more likely to die than the general population of the same age and gender, compared to 7.5 times more likely for Comparison Group clients.**

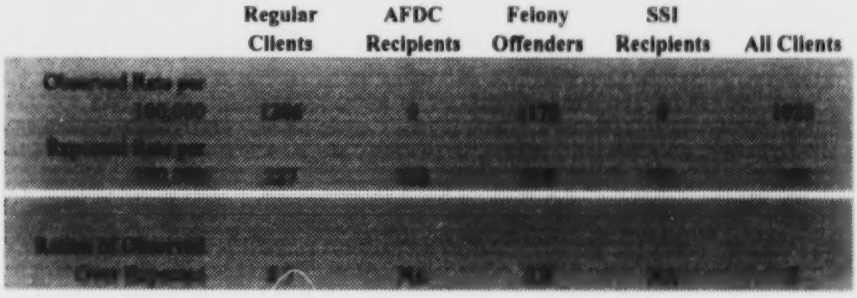
These are only very approximate results and estimates. The magnitude of the differences suggest, however, that treatment may indeed lower mortality rates. Once again a larger sample of cases and a longer period of time is necessary to validate these tentative findings.

Figure 8
DEATH RATES OF ADATSA CLIENTS
Compared to Expected Rates
(Based on Washington Population of the Same Gender and Age)*

Regular Clients
In Treatment and Comparison Groups



Regular Clients and Special Groups
(Treatment and Comparison Groups have been combined within each group.)



* From Washington State Annual Summary of Vital Statistics 1990, DOH: Center for Health Statistics
** "Regular clients" are those who did not receive AFDC or SSI and/or were not felony offenders.
***"All clients" include all ADATSA eligible clients.

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Summary and Discussion

The mortality results are only very approximate due to the small number of cases and the relatively short follow-up period. The magnitude of the differences found, however, provide support for the following conclusions:

With the exception of AFDC recipients, ADATSA clients have much higher mortality rates than the general population of the same age and gender.

Treatment may indeed lower mortality rates in the 18 month period following treatment. This finding suggests potentially high benefits in a society-wide cost-benefit analysis of treatment. (See the discussion in Chapter 6 of the high social costs of mortality.)

A larger sample of cases followed over a longer period of time would be necessary to validate these tentative findings.

APPENDIX 1
Methods

DETAILED METHODS AND STATISTICAL TECHNIQUES

Three Steps

There are three major steps in testing for treatment effects in a retrospective research design:

- The selection of naturally occurring Treatment and Comparison groups so that selectivity effects are minimized.
- The execution of statistical tests to ascertain whether treatment effects exist after controlling for measurable differences in pre-treatment characteristics between Treatment and Comparison groups.
- The calculation of the magnitude of treatment effects, adjusted for pre-treatment differences, so that the size of treatment outcomes can be easily interpreted.

The Problems Resulting from Selectivity and Differences in Pre-Treatment Characteristics in Retrospective Designs

Since random assignment to treatment was not possible, clients in the Treatment Group may differ from those in the Comparison Group in terms of two sets of factors:

1) selectivity: i.e. in this study, differences in the motivation or disposition of clients due to self-selection and/or pressures to obtain/not obtain, complete/not complete treatment;
2) pre-treatment characteristics: i.e. in the case of ADATSA clients, differences in social, demographic, physical, and mental factors, drug and treatment history, criminal involvement, prior employment and publicly funded services experiences.

The above factors may affect outcomes irrespective of treatment or may interact in special ways with treatment. If these factors are not the same in both Treatment and Comparison Groups apparent differences in outcomes between the two groups may be due to differences in these factors and not to the effectiveness of treatment. (See Cook and Campbell 1979, 103-118; Kleinbaum, et. al., 1982: 1-50.)

Step 1: Selectivity and the Selection of Treatment and Comparison Groups

Differences in motivation or disposition of clients may occur as clients select themselves to receive or not receive treatment. These differences are hard to eliminate other than by an experimental design in which clients are randomly assigned to experimental and control groups. However, differences in these factors can be minimized in a retrospective design by the careful choice of a comparison group.

The Comparison Group clients chosen for this study are the same as those in the earlier ADATSA report. (Longhi, et.al., 1990.) They shared with Treatment Group clients the fact that they sought public assistance at a local Community Service Office. Given an appointment for an ADATSA assessment, they showed up to meet with an ADATSA counselor at the Assessment Center. They were then assessed and considered eligible for treatment. Up to this point motivational factors should have been similar.

The possible differences due to selectivity lie in the fact that Comparison Group clients did not accept (and/or were not accepted for) a particular treatment path or did not show up for treatment.* However, two findings from our earlier report suggest that these differences may be minor and unrelated to treatment outcomes:

- Client profiles changed little from eligibility to starting and completing treatment. In particular only two out of fifteen factors significantly decreased the chances of starting treatment: having physical or mental problems (Longhi et. al., 1991: 58-63).
- Clients having court-ordered assessments were just as likely as other clients to start treatment, complete treatment and become employed. Since legal coercion is presumed to have different consequences on motivation than voluntarily seeking help, this finding calls into question the role of motivation in obtaining treatment and in achieving certain treatment outcomes.

Step 2: Pre-Treatment Characteristics and Statistical Controls

Those who did not show up for treatment represent about two thirds of the Comparison Group. Those not mutually accepted for a particular treatment constitute the remaining third.

Pre-treatment differences in client characteristics can be controlled for, or adjusted statistically, as long as these characteristics are measured. Among the many measured characteristics in this study, fifty were chosen on the basis of their likelihood of predicting treatment outcomes in general.

The statistical procedure used was to construct the best possible statistical prediction model of employment based on these fifty characteristics. The independent and unique effects of treatment on employment were then tested adjusting for the possible influence of all these other factors.

This procedure is referred to as 'mathematical modeling' in the epidemiological research literature (Kleinbaum et. al., 1982: 315-319). The statistical tools used for building the best statistical prediction model were Logistic Regression for employment and participation in public assistance programs and Least Squares Regression for earnings and costs incurred while on assistance. (See SAS/STAT User's Guide, 1990: Chapters 27 and 36: Glantz and Slinter: Chapters 3,6 and 11.)

* The background characteristics and treatment outcomes of these two comparison Subgroups were found to be very similar.

A Logistic Regression model, instead of a more traditional Analysis of Covariance model, was used for predicting employment since employment is a dichotomous, binary, employed/not employed, variable. Similarly, receiving public assistance or not is a dichotomous yes/no variable. In the case of earnings and assistance costs, covariance analysis could have been used, but Least Squares Regression is mathematically equivalent and with the use of "dummy variables" offers more convenient statistical tools for obtaining predicted values of the dependent variable. (See Blalock 1979: 534-538.) The variables included in the statistical prediction models and their effects on particular outcomes are presented in the Appendix of each chapter.

Correlations and Exploratory Analyses

We explored all the possible variables which measured client backgrounds and pre-treatment experiences and found that about fifty were likely to affect outcomes. These variables sometimes measured a general characteristic, like marital status, sometimes they identified particular groups of clients which were found to have unusually different outcomes, like men less than age 30.

For any given treatment outcome, about half of the fifty variables were found to be significantly correlated to that outcome either in the treatment group or the comparison group.

For example higher earnings in the post period were related to the following variables: age less than 30, being a man less than 30, education beyond high school, living with others rather than alone, living with a family, no mental health or emotional problems, no physical problems, length of use of drugs or alcohol, use of drugs rather than alcohol, fewer prior assessments, lower prior welfare and treatment expenses, being new to welfare, having had prior employment, and having high average earnings in the past. (See bivariate results in Figure 3 of the Appendix to chapter 2.)

Multivariate Analysis of Independent Effects

Among this smaller subset of variables even fewer were found to have unique, independent effects on a particular outcome. The rest of the variables did not significantly increase or decrease the likelihood of improvement in that outcome beyond the independent effect of these few variables. For example, the clients length of drug/alcohol use did not matter in terms of his/her likelihood of employment once we knew and controlled for the clients age. (See the variables with statistically significant effects in the multivariate results in the Appendices of chapters 2 through 7)

The Complications of Interactive Effects

Whenever justified by the research literature, and by our exploratory analyses, we tested for possible interactive effects (effects on outcomes above and beyond the additive effects of background variables and treatment). These were interactions of treatment with particular background variables, interactions of background variables with each other, and interactions of treatment with an interactive combination of background variables. (See Kleinbaum 1982: 476-491.)

Interactions of Treatment With Background Variables

We systematically explored for the existence of these interactions by looking at differences in the multivariate statistical results conducted separately among Treatment and Comparison Group clients. We then tested for the statistical significance of these possible interactions in a combined multivariate analysis for both groups.

For example, having prior employment experience seemed to have a *different* effect on obtaining any employment in the follow-up period within the Treatment Group than it did in the Comparison Group. We conducted a combined multivariate analysis for both groups testing the significance of this difference. We found that treatment had no statistically significant effect on this outcome (obtaining any employment) if the client had no prior employment experience.

(See also the significant interactive effects of treatment among clients with and without mental health problems in the multivariate results in the Appendix.)

Interactions among background variables

A less systematic search was made of possible interactions among the background variables themselves. Only those prompted by the literature and by our own exploratory findings were tested. For example, the fact that age may affect employment differently depending on gender was suggested by the general literature on social stratification and social mobility. The possibility of mental health interacting with some other background variables, such as education level, originated from our exploratory analyses.

Interactions of Treatment with an Interactive Combination of Background Variables

A further complication arose when treatment effects were different depending on particular combinations of background variables. For example, treatment had a different effect on employment outcomes among a particular age and gender combination: among women age 30 or over who were regular ADATSA clients. It was a small group of clients, but the interaction was statistically significant.

The Final Statistical Model and the Effects of Treatment on a Particular Outcome

The final result of all the above analyses was a statistical model that incorporated the additive and/or interactive effects of background variables and the additive and/or interactive effects of treatment. This model statistically tests for overall effects of treatment among all clients (i.e. additive effects) regardless of background characteristics. It also tests for possible different effects of treatment depending on subgroups of treated clients or depending on combinations of particular client characteristics (i.e. interactive effects).

- An example of an overall treatment effect is the higher earnings during the follow-up period among clients in the VOTE program who completed extra vocational training versus those not completing such training. (See Figure 3, Appendix 3.)
- An example of an interactive effect of treatment is the higher cost of outpatient medical treatment costs for clients who are pregnant women in the Treatment Group. Pregnant women not in the Treatment Group have the same outpatient medical costs as other clients. (See Figure 4, Appendix 4.)

Statistical models in regression analyses take the form of :

$$y = b_0 + b_1 x_1 + b_2 x_2 \text{ ---- } b_n x_n + e$$

The terms in this equation are as follows:

y is the dependent variable (outcome)

x_1 through x_n are the independent variables (client background characteristics, treatment and or interaction)

e is an error term

b_1 through b_n are the coefficients: which depict the independent effect of each variable on the dependent variable (outcome).

Step 3: The Calculation of Adjusted Outcomes: the Magnitude of Treatment Effects

The last step is to present the results of the statistical model in the most understandable form. This means showing the *outcome levels achieved* by the average Treatment Group client and the average Comparison Group client, if these two groups had the same background characteristics. The difference between the two outcome levels constitutes the *magnitude of the effect of treatment* since the effects of confounding background differences are eliminated by holding them constant (assuming, for purposes of this discussion, no further selectivity effects).

In statistical terminology this step is referred to as calculating the *estimated, predicted or expected values* of outcomes for Treatment and Comparison Groups had these groups been the same on the background characteristics included in the analysis. This step is also referred to as "calculating the *adjusted values of outcomes*:" i.e. adjusted for the confounding effects on outcomes of differences between Treatment and Comparison Groups in background variables included in the analysis. (See Cook and Campbell, 1979: 170-175.) The difference between the

adjusted outcomes for the two groups constitutes the statistically estimated or adjusted effect of treatment.

Sometimes, we made these adjusted outcome calculations for the average client who received ADATSA treatment services and for the average Comparison Group client who did not. More often, when treatment had different effects among major subgroups of clients, it was necessary to calculate the treatment outcomes separately for the average Treatment and Comparison Group client in each major subgroup. Finally, since we were able to identify clients who had either low or high prospects of obtaining a particular outcome even before treatment, we calculated the estimated outcomes among those Treatment and Comparison Group clients who shared the same initially unfavorable or favorable characteristics.

The Definition of Average Client

There were different options in defining the average ADATSA client. We chose to define the average client as the client who had the average pre-treatment characteristics of the combined Treatment and Comparison Groups. The adjusted outcomes of treatment for this average ADATSA client are the outcomes he/she would have achieved had all *ADATSA assessed and eligible clients gone into treatment.* These adjusted outcomes also *approximate the most probable effects of a randomized assignment* of ADATSA clients to a Treatment and a Control Group had we conducted an experimental study instead of a retrospective one. Randomization would have made the average pre-treatment characteristics very similar for both Treatment and Control Groups. These two groups averages would, by definition, be similar to the average characteristics of all ADATSA assessed and eligible clients.

Calculations of Adjusted Outcomes for Average Clients

In calculations for these point estimates of outcomes we first found the average values for the relevant pre-treatment characteristics combining both Treatment and Comparison Group clients. Then we multiplied the average value for each pre-treatment characteristic by the expected effect of that characteristic on the outcome. This included the effects of interaction effects of pre-treatment characteristics with treatment in the case of the average Treatment Group client. We also added the main additive effect of treatment when it was significant. The expected effects on outcomes of each pre-treatment and treatment variable and/or their interaction are provided by the statistical model ($b_1 - b_n$ in the equation on page 120).

The sums of all the products of variables and effects obtained separately for the average Treatment Group client and the average Comparison Group client constitute the two adjusted outcomes: one for the Treatment Group and one for the Comparison Group. The difference between the two adjusted outcomes (between Treatment and Comparison Groups) depicts only the treatment effect (and any unmeasured selectivity), not the effects of differences in measured background characteristics.

In the case of least squares regression used to adjust to earnings and public assistance cost outcomes, the formula for the adjusted treatment group outcome is

$$\hat{y} = b_0 + b_1\bar{x} + b_2\bar{x}_2 \text{----} b_n\bar{x}_n$$

where the "dummy" variable treatment (coded: 0 or 1) is equal to 1.

The formula for the adjusted comparison group outcome is the same formula as above where the "dummy" treatment variable (coded: 0,1) is equal to 0.

In the case of logistic regression, used to adjust dichotomous outcomes (employed/not employed, re-entered/not re-entered treatment, etc.), the formula for the adjusted treatment and comparison group estimates takes one more step.

The y values obtained (as in least squares regression described above) are in logit forms (the natural log of the probability (p) of the event occurring divided by the probability ($1-p$) of the event not occurring.

In formulas notation the expected value of $\hat{y}$ is:

$$\hat{y} = log_e\left(\frac{\hat{p}}{1-\hat{p}}\right)$$

where $\log_e$ denotes the natural logarithms.

Solving for $\hat{p}$ this formula translates to:

$$\hat{p} = \frac{e^{\hat{y}}}{(1+e^{\hat{y}})}$$

where e is equal to 2.71828, the base value of natural logarithms. (See SAS/STAT Users Guide 1990: 484.) That is, the adjusted probability of the event happening is given by the natural antilog of $\hat{y}$ divided by the sum of 1 and the natural antilog of $\hat{y}$. These $\hat{y}$ are calculated separately for Treatment and Comparison Groups as in least squares regression discussed above.

These procedures achieve the goal of presenting the magnitude of differences in outcomes between Treatment and Comparison Groups which are due *only* to treatment (or any selectivity) in an easily interpretable way.

The Definition of Low or High Prospect Clients

The statistical models also allowed us to determine the combination of pre-treatment client characteristics which lead to particular clients having low or high prospects of achieving certain outcomes. So on the basis of these models we were able to calculate the magnitude of the effect of treatment on certain outcomes not only for average clients but also for low or high prospect clients. (Kleinbaum, et. al., 1982: 482-484.)

For example, for the average client among men less than age 30 we had already calculated the adjusted substantive-continuous employment outcome: it increased from 16 percent to 31 percent after ADATSA treatment (16 percent for the average man less than age 30 in the Comparison Group versus 31 percent for the average man less than age 30 in the Treatment Group).

Example of Calculations of Adjusted Outcomes for High Prospect Clients

Of further interest was how well treatment did in this respect among men less than age 30 who already had high prospects of employment even before treatment. This would provide us with the upper bound effect of treatment on employment with most favored clients. The statistical model showed that these clients were ones with prior employment experience, more than a high school education and no mental health problems. For these high prospect clients among younger men, we estimated that substantive-continuous employment rates would increase from 49 percent to 68 percent after treatment: a large increase and a very high rate of employment. Two thirds of these clients are expected to be substantively-continuously employed after treatment.

Example of Calculations of Adjusted Outcomes for Low Prospect Clients

Conversely, of interest was the degree to which treatment made a difference in employment outcomes among younger men who had very low prospects: those without prior work experience, with a high school or lower level of education and with mental health problems. Not surprisingly, our estimates of the overall levels of substantive-continuous employment were low among these particularly disadvantaged younger men. They constitute the lowest bounds among these clients. However our calculations showed that rates of substantive-continuous employment were expected to increase from 8 percent to 15 percent.

Statistical Feasibility of Calculating Adjusted Outcomes for High-Low Prospect Clients

These estimates were possible even though our sample sizes were very small in many instances for particular subgroups of low or high prospect clients. The statistical feasibility of these estimates is due to the fact that the statistical models we generated were based on statistically significant factors affecting outcomes among <u>all</u> clients, including low and high prospect clients. The degree of precision of the outcome estimates for low and high prospect clients (at both the lowest and

highest extreme of our statistical prediction range) is lower than for average clients (who are at the middle of our statistical prediction range). (See Gujarti, 1978: 88-91.) However, our calculated adjusted outcomes at these upper and lower bounds still constitute the best available point estimates and indicate the predicted effect of treatment at these extremes.

Figure 1
ADATSA SAMPLE SIZES

For All Clients, Regular Clients, AFDC Recipients and Felony Offenders

After Matching with Other Management Information System Records

Assessed	1,118
Eligible	909
Eligible who did not die (N=15) or were not on SSI Grants (N-5)	889

Eligible, who also matched to Income Assistance (OFM Eligibility File) and Medicaid Records (MMIS) (97% match rate)

Groups:	Regular Clients	AFDC Recipients	Felony Offenders	Total
Treatment Group:	408	136	101	645
Comparison Group:	144	40	32	216
Total	552	176	133	861

Eligible, who also matched to the Social Service Payment System (SSPS) And Substance Abuse Management System (SAMS) Records (84% match rate)*

Groups:	Regular Clients	AFDC Recipients	Felony Offenders	Total
Treatment Group	353	112	92	557
Comparison Group	133	29	29	191
Total	486	141	121	748

NOTE: This is the sample which was also matched against Employment Security records, since accurate Social Security Numbers were necessary for that match.

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Figure 2

BACKGROUND CHARACTERISTICS

Treatment and Comparison Groups

Among Regular Clients*

	Treatment Group (n = 408**)	Comparison Group (n = 144**)
Demographics		
Gender, % Male	72%	72%
Race /Ethnicity, % White	70%	67%
Age, less than 30	39%	32%
More than High School Education	23%	16%
Demographics, Household		
Marital Status (Married)	11%	14%
Homeless or Shelter	22%	22%
Living with Relatives or Others	53%	48%
Client is Pregnant	3%	2%
Health		
Family History of Mental Problems	18%	16%
Mental/Emotional Problem	28%	24%
Maybe Suicidal	32%	28%
Physical Problem	17%	32%
Client Recommended for a Physical	28%	34%
Criminal Justice Involvement		
Client Ever Received DWI	53%	50%
Assessment prompted by Criminal Justice System	26%	15%
Substance Abuse Status		
Age at First Use	17	17
Number of Years of Use	17.0 yrs	15.1yrs
Hard Drug Users	49%	39%
Alcohol Only Users	33%	37%
Family History of Chemical Dependency	88%	89%
Prior Treatment		
Any Prior Admission to Detox	49%	46%
One or More Prior Admissions to ADATSA or non-ADATSA treatment	71%	73%
Employment Status		
Prior Average Wages	$201	$68
Gateway (% with no costs before)		
Gateway	37%	34%
Prior Costs		
Total Prior Costs	$1,763	$3,333
Prior Income Assistance Costs	$793	$923
Prior Medical Costs	$883	$1,807
Prior Treatment Costs	$367	$592
Prior Costs for Non-Gateway Clients		
Total Prior Costs	$2,788	$4,127

*Regular Clients" are those who did not receive AFDC or SSI and/or were not felony offenders.

**Sample size for eligible regular clients who could be matched for Income Assistance and Medicaid records.

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Figure 3

COMPARISON OF ADJUSTED AND NON-ADJUSTED OUTCOME MEASURES

Among Regular Clients: Treatment Group and Comparison Group Results

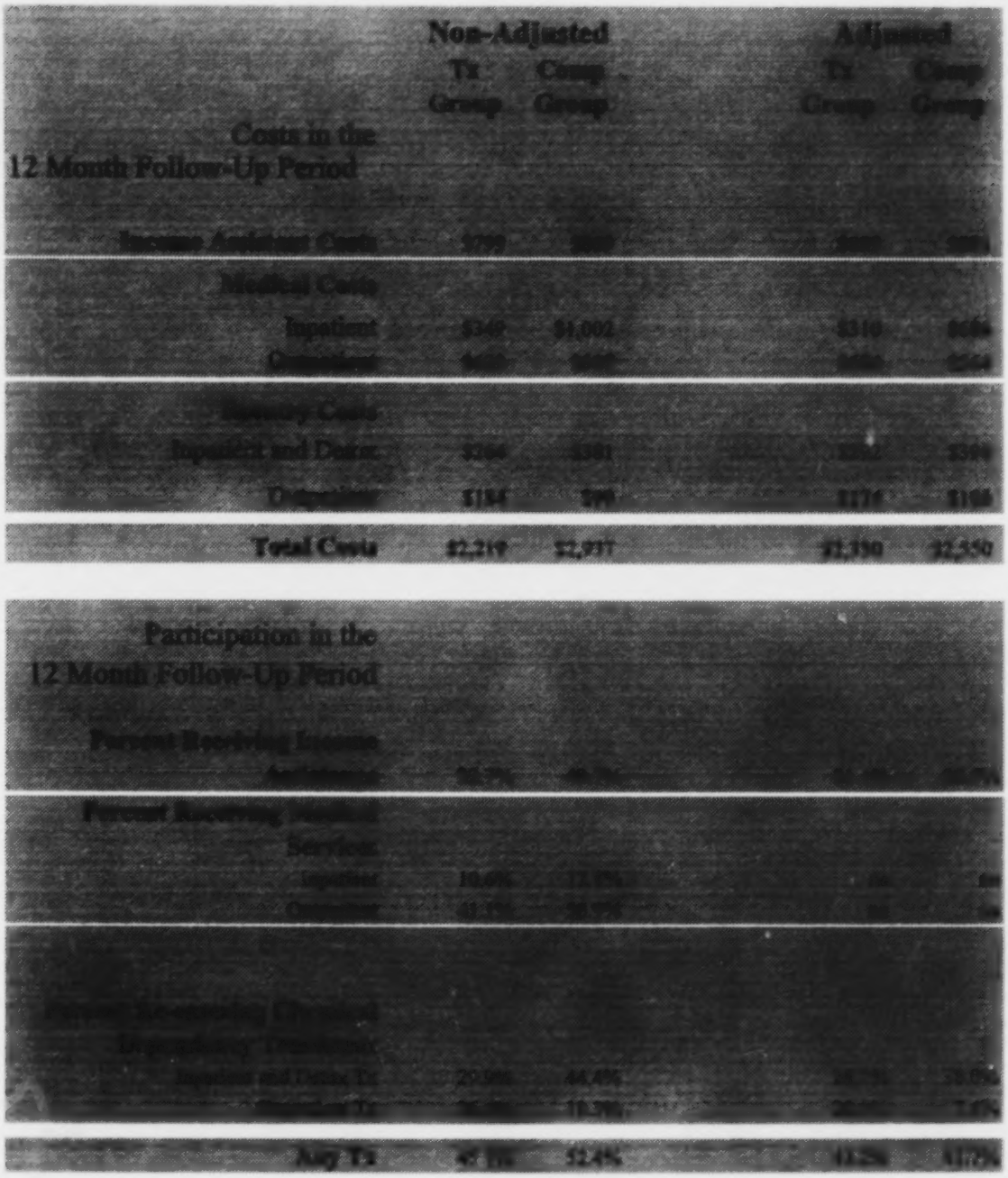

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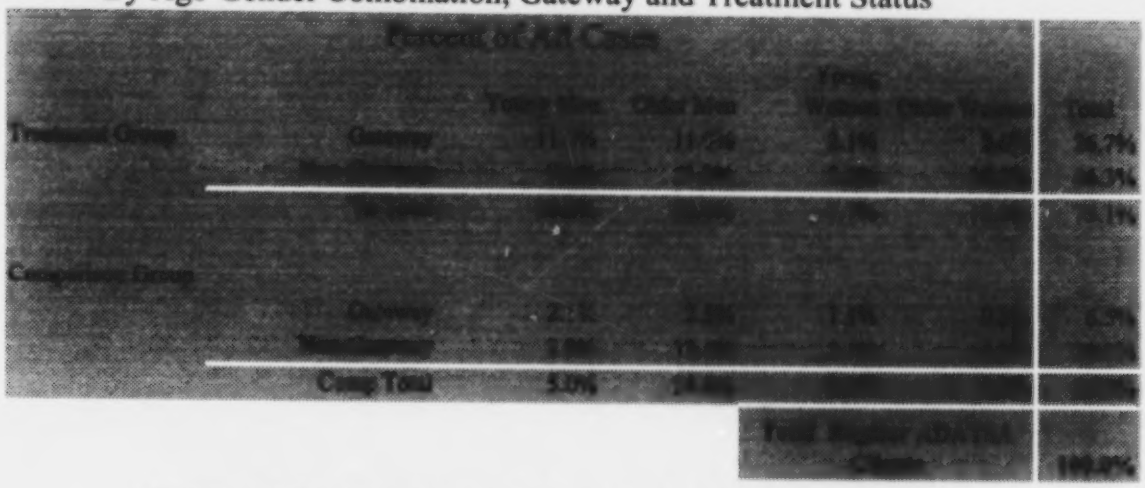
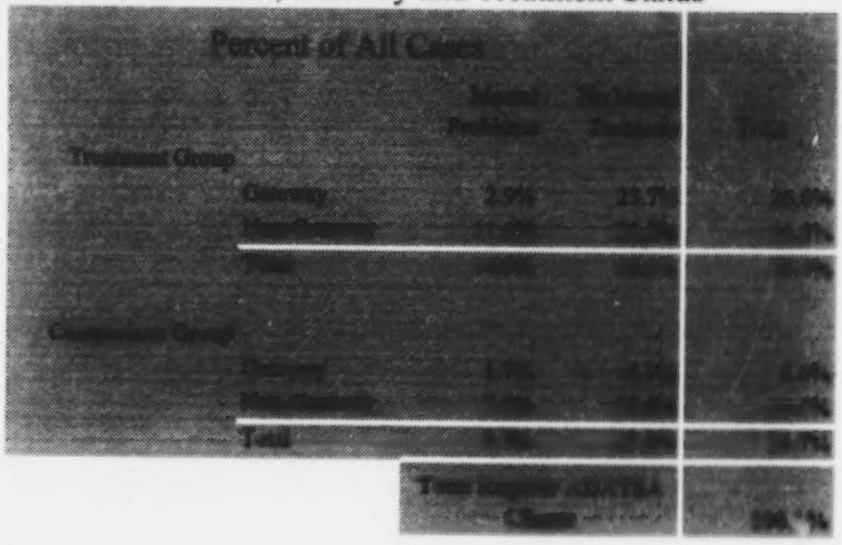
Figure 4

PROPORTION OF REGULAR ADATSA CLIENTS IN SUBGROUPS

By Age-Gender Combination, Gateway and Treatment Status



By Mental Health Status, Gateway and Treatment Status



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APPENDIX 2
Statistical Models for Chapter 2

Figure 1
Statistical Model of
ANY EMPLOYMENT OUTCOMES
of ADATSA Treatment

The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Any Employment In the 18 Month Follow-Up Period

	Results of Logistic Regression Analysis		
	Bivariate	Multivariate	
Independent Variables	Significant Correlation Coefficients with Any Employment	Regression Coefficients with Any Employment	Significance Level
Demographics, Self			
[redacted]			
[redacted]			
[redacted]	+0.17		
[redacted]	+0.13		
[redacted]	+0.09		
[redacted]	-0.09		
[redacted]	-0.07		
[redacted]			
[redacted]	+0.10		
[redacted]	+0.17		
Demographics, Household			
[redacted]			
[redacted]	+0.10		
[redacted]			
[redacted]	-0.10		
[redacted]	+0.10		
Health and Attitude			
[redacted]			
[redacted]			
[redacted]	+0.20	+0.39	[redacted]
[redacted]	+0.21	+0.36	[redacted]
[redacted]	+0.10		
[redacted]			
[redacted]			
Criminal Justice Involvement			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
Substance Abuse Status			
[redacted]			
[redacted]	-0.07		
[redacted]	-0.11		
[redacted]			
[redacted]	+0.07		
Pre-Treatment Status			
[redacted]			
[redacted]			
[redacted]			
[redacted]	-0.10		

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	Bivariate	Multivariate	
Independent Variables	Significant Correlation Coefficients with Any Employment	Regression Coefficients with Any Employment	Significance Level
Gateway			
"Gateway": no welfare or treatment in previous year	+0.14		
Prior Employment			
Prior Employment	+0.37	+0.55	n.s.
Average monthly pre-tx wage	+0.38		
Treatment Status			
Client Placed on Waiting List			
Treatment in path			
Completing at least some tx	+0.16	-0.33	n.s.
Completed all			
Completed primary	+0.16		
Not started	-0.10		
Treatment Interactions			
Prior employment and treatment	+0.38	+1.30	0.0001
Male, 21-30 and treatment	+0.17		
Female, 21-30 and treatment	+0.11		
Female, 30+ and treatment			
No known problem and treatment	+0.35		
Model Intercept			
Intercept		-1.38	0.0001

The overall model chi square is 98.221, with a significance level of 0.0001: concordant pairs =70.2%, discordant = 18.9% and tied = 10.9% among 51,357 pairs.

NOTE: Blank cell or "n.s." = not significant regression coefficient of any employment with given independent variable.

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Figure 2
Statistical Model of
SUBSTANTIVE-CONTINUOUS EMPLOYMENT OUTCOMES
of ADATSA Treatment

The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Substantive-Continuous Employment in the 18 Month Follow-Up Period

	Results of Logistic Regression Analysis		
	Bivariate	Multivariate	
Independent Variables	Significant Correlation Coefficients with Substantive Employment	Regression Coefficients with Substantive Employment	Significance Level
Demographics, Self			
[illegible]			
[illegible]			
[illegible]	+0.15		
[illegible]	+0.17	+1.85	[illegible]
[illegible]		+1.04	[illegible]
[illegible]	-0.11		
[illegible]		+2.38	[illegible]
[illegible]			
[illegible]	+0.13		
[illegible]	+0.18	+1.42	[illegible]
Demographics, Household			
[illegible]			
[illegible]	+0.11		
[illegible]	-0.12		
[illegible]			
[illegible]	+0.11		
Health and Attitude			
[illegible]			
[illegible]			
[illegible]			
[illegible]	+0.18		
[illegible]	+0.14		
[illegible]	+0.14		
[illegible]			
[illegible]			
Criminal Justice Involvement			
[illegible]			
[illegible]			
[illegible]	+0.19		
[illegible]	+0.20		
[illegible]	+0.19		
Substance Abuse Status			
[illegible]	+0.18		
[illegible]	-0.14		
[illegible]			
[illegible]			
[illegible]			
Pre-Treatment Status			
[illegible]			
[illegible]	-0.13		
[illegible]			
[illegible]	-0.09		

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Independent Variables	Bivariate: Significant Correlation Coefficients with Substantive Employment	Multivariate: Regression Coefficients with Substantive Employment	Multivariate: Significance Level
Gateway			
"Gateway": no welfare or treatment in previous year	+0.16		
Prior Employment			
Prior Employment	+0.20	+1.85	0.0013
Average monthly pre-tx wage	+0.25		
Treatment Status			
Client Placed on Waiting List			
Inpatient tx path			
Completed at least some tx	+0.14	+1.56	0.0214
Completed all			
Completed primary			
Not starved			
Treatment Interactions			
Prior employment and treatment	+0.25		
Male, LT 30 and treatment	+0.20	-0.75	n.s.
Female, LT 30 and treatment		-0.69	n.s.
Female, 30+ and treatment		-2.57	0.0087
No mental problem and treatment	+0.17		
Model Intercept			
Intercept		-4.36	0.0001

Overall model chi square is 53.716, with a significance level of 0.0001: concordant pairs = 69.3%, discordant 22.8% and tied = 7.9% among 3,298 pairs.

NOTE: Blank cell or "n.s." = not significant regression coefficient of substantive-continuous employment with given independent variable.

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Figure 3
Statistical Model of
AVERAGE MONTHLY EARNINGS OUTCOMES
of ADATSA Treatment

The Effects of Client Characteristics, Pre-Treatment Experiences And Treatment on Average Monthly Earnings In The 18 Month Follow-Up Period

	Results of Least Squares Regression Analysis		
	Bivariate	Multivariate	
Independent Variables	Significant Correlation Coefficients with Earnings*	Regression Coefficients with Earnings	Significance Level
Demographics, Self			
White/Minority			
Gender			
Age Less Than 30	+0.18		
Male, LT 30	+0.19	[illegible]	n.s.
Female, LT 30		[illegible]	n.s.
Male, Age 30+			
Female, 30+		[illegible]	[illegible]
High School Only			
More than High School	+0.17	[illegible]	[illegible]
More than High School and no mental problems	+0.21		
Demographics, Household			
No. of Children			
Living With Others	+0.12		
Living on Street or in Shelter			
Living Alone in Own Apartment or Hotel			
Living With Own or Other Family	+0.12		
Health and Attitude			
Family History of Chemical Dependency			
Family History of Mental Illness			
No Mental/Emotional Problem	+0.15	[illegible]	n.s.
No Physical Problem	+0.15		
No Medical Problem	+0.16		
Client Sees Advantages Sobriety			
Client is Goal Oriented			
Criminal Justice Involvement			
Client Ever Charged With Crime			
Client Ever Received DWI			
On Parole or Probation			
Assessment prompted by Criminal Justice System			
Assessment Pre-Empted by Criminal Justice System			
Substance Abuse Status			
Age at First Use	+0.11		
Number of Years of Use	-0.10		
Uses Alcohol Only	-0.11		
Uses "soft" drugs with or without alcohol			
Uses any "hard drugs"			
Pre-Treatment Status			
Any Prior dwaj			
More than 1 prior assessment	-0.10		
More than 1 Prior admission to treatment			
Total Pre-Treatment exposure	-0.11		

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Independent Variable	Bivariate: Statistical Correlation Coefficient with Earnings	Multivariate: Regression Coefficient with Earnings	Multivariate: Significance Level
Gateway			
"Gateway": no welfare or treatment in previous year	+0.39		
Prior Employment			
Prior Employment	+0.33		
Average monthly pre-tx wage	+0.41	$9.58	0.0001
Treatment Status			
Client Placed on Waiting List			
Dependent Child			
Completed tx but not dlt tx Treatment Comparison Group	+0.10	-$30.39	n.s.
Dropped dlt tx Treatment Comparison Group	+0.02	$131	0.0147
Completed tx only			
Not treated	-0.11		
Treatment Interactions			
Prior employment and treatment	+0.33		
Male: [?] dlt and treatment	+0.19	$78.22	n.s.
Female [?] dlt and treatment		$48.69	n.s.
Female sex and treatment		-$269	0.0353
No mental problem and treatment	+0.22	$105	n.s. (0.1417)
Model Intercept			
Intercept		$3.13	n.s.

The overall model R squared is 0.2176, with a significance level of 0.0001.

NOTE: Blank cell or "n.s." = not significant regression coefficient of earinings with given independent variable.

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Note On Multivariate Relationships Between Earnings, Treatment and Other Factors

Multivariate regression analyses of earnings were run for three groups of clients: all clients; clients with earnings in the post period greater than 0 (excluding all those with no Earnings); clients with earnings in both the pre and post period greater than 0 (excluding all those with no earnings in either the pre or the post periods). The results for these three groups were similar. Therefore, we decided to report the results for all clients, including those clients with no earnings; these results are based on the same clients as those used for Substantive Employment. Multivariate Discriminate Analysis was run to discriminate between three groups of clients: those with no earnings; those with some earnings at less than a substantive level; and those clients with substantive earnings. The results for this analysis were also similar to the multivariate regression analysis. Finally, we ran alternative models including all interaction terms and only the significant interaction terms; again, the results were identical. The model reported is that for all clients with significant main effect of completing all treatment and some interactions: women 30 yrs or over and no mental problems.

Note on Different Employment Patterns for Women Age 30 or More and the Influence of Mental Health Problems

Substantive Employment

The rates of substantive employment were significantly different for women age 30 or more than they were for any other subgroup. Further analysis of the women in this sample showed several interesting trends.

For women age 30 or more in the Comparison Group (n=19), there was a higher rate of mental problems than in any other group, 53% compared to about 20% for all the other subgroups.

The rate of substantive Employment among the women age 30 or more in the Comparison Group with mental problems was much higher than was predicted by the multivariate logistical model; 30% were substantively employed whereas the model would have predicted almost none would have substantive employment.

Earnings

In order to further investigate different patterns of earnings in the post period, the model was repeated for subgroups of men, women, women with mental problems, and women without mental problems. Several interesting patterns emerged from these analyses.

For all men, and for women without mental problems, consistent patterns emerged. The same three variables were related to higher earnings in the post period:

1) Higher average wages before assessment or treatment
3) More than a high school education.
3) Treatment: Completing all treatment was significant for the subgroup of all men.

   Completing any treatment was significant for the subgroup of women under 30 with no mental problems.

   For women of any age with mental problems, different patterns emerged. Women with mental problems in the Comparison Group had significantly higher earnings than similar women in the Treatment Group.

APPENDIX 3
Statistical Models for Chapter 3

DETAILED METHODS FOR VOCATIONAL TRAINING STUDY

Client Selection

Information on a new group of ADATSA clients was gathered for this analysis, consisting of *all clients who received services* from the three pilot vocational training programs. A Comparison Group of clients was selected from the primary sample of clients; i.e., the one utilized in the previous and subsequent chapters. The Comparison Group was composed of clients who received ADATSA treatment but did not receive extra vocational training.

For each pilot vocational program, all clients whose vocational training ended during the period from September 1, 1989 through June 30, 1990, were included in the study. This coincides with the period during which the comparison group clients were completing their ADATSA training. In other words, both Treatment and Comparison Group clients completed treatment and were ready to enter the job market during the same period.

Since there are differences among the job markets for different counties, the Comparison Group of clients not receiving vocational training was restricted to those clients who resided in the six counties proximate to the three pilot vocational training programs.

Please note that the results in this chapter cannot be directly compared to the results in the other chapters. Not all the clients covered in the other chapters are included in the Comparison Group for this chapter, and the clients receiving extra vocational training were not included in the other chapters.

Data Sources

The data for clients in the extra vocational training programs were extracted from case records at the three pilot vocational training programs, from the earnings database at the Department of Employment Security, and from the Division of Vocational Rehabilitation client database.

Pre-Training Differences in Client Characteristics

Clients receiving extra vocational training may have been quite different from clients not receiving the training due to the ways in which they were selected. Program clients were selected by staff from among all clients according to individual program policy and client personal choice. This could be expected to result in pre-training differences between the two groups (e.g., differences in prior work experience or education). Such differences could be expected to result in variations in post-training employment, independent of the effects of extra training. Therefore, in order to find out if vocational training itself increased employment, it was essential to control for relevant pre-training differences.

Data were available for all extra vocational training clients on a total of seven pre-training characteristics which were relevant to post-training employment: gender, age, education level, ethnicity, marital status, prior employment, and prior wages. All seven were entered as control variables in the data analysis. This was done in order to test for the independent effect of vocational training on employment regardless of pre-training differences.

The question may arise as to whether these seven client characteristics were adequate to control for pre-training differences. In contrast to these seven, fifty characteristics were available for the analysis of the effects of regular ADATSA treatment on employment presented in Chapter 2. However, only six of those fifty had a significant, independent effect on post-treatment employment in that chapter's analysis. Fortunately, four of those six characteristics were also present among the seven available for the extra vocational training analysis: gender, age, education level and prior employment. The two missing characteristics were "physical problems" and "mental health problems". The latter characteristics had a relatively minor influence compared to gender, age and prior employment experience. Therefore, we consider the seven variables an adequate set of controls to justify the analysis.

Figure 1
Statistical Model of
ANY EMPLOYMENT OUTCOMES
Of Pilot Vocational Programs

The Effects of Client Characteristics, Pre-Treatment Experiences And Pilot Vocational Programs on Any Employment In the 18 Month Follow-Up Period

Independent Variables	Regression Coefficient with Any Employment	Significance Level
Background Characteristics		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]		
[redacted]		
[redacted]	[redacted]	[redacted]
Pilot Vocational Programs		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

The overal model chi square is 147.349, with a significance level of 0.0001; concordant pairs = 73.9%, discordant = 21.5%, and tied = 4.6% among 76,383 pairs.

NOTE: Blank cell or "n.s." = not significant coefficient of any employment with given independent variable.

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Figure 2
Statistical Model of
SUBSTANTIVE-CONTINUOUS EMPLOYMENT OUTCOMES
Of Pilot Vocational Programs

The Effects of Client Characteristics, Pre-Treatment Experiences And Pilot Vocational Programs on Substantive Employment In the 18 Month Follow-Up Period

Independent Variables	Regression Coefficients with Continuous Employment	Significance Level
Background Variables		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]		
[redacted]		
[redacted]	[redacted]	[redacted]
Pilot Vocational Programs		
[redacted]	[redacted]	[redacted]
Completers vs. Non-Completers: Comparisons between clients who completed extra vocational services with clients who started but did not complete these vocational services		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
Non-Completers vs. No Services: Comparisons between clients who started but did not complete extra vocational services with clients who had no extra vocational services		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Overall model chi square is 76.472, with a significance level of 0.0001; concordant pairs =7`.2%, discordant = 23.4%, and tied, = 5.4% among 61,380 pairs

NOTE: Blank cell or "n.s." = not significant regression coefficient substantive-continuous employment with given independent variable.

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Figure 3
Statistical Model of
AVERAGE MONTHLY EARNINGS OUTCOMES
Of Pilot Vocational Programs
The Effects of Client Characteristics, Pre-Treatment Experiences And Pilot Vocational Programs on Earnings In the 18 Month Follow-Up Period

	Results of Least Square Regression Analysis Multivariate	
Independent Variables	**Regression Coefficients with Average Earnings**	**Significance Level**
Background Variables		
Gender (Female)	**-114.51**	**0.0033**
Age Less than 30	**45.97**	**n.s.**
Ethnicity		
Education		
Average Monthly Wages Pre-Treatment	**0.53**	**0.0001**
PILOT VOCATIONAL PROGRAMS		
Completer vs. Non-Completers: Comparisons between clients who completed vocational services with clients who started but did not complete these vocational services		
VOTE	**148.8**	**0.0055**
ACEP	**483.45**	**0.0001**
RRR	**213.05**	**0.0162**
Non-Completers vs No Services: Comparisons between clients who started but did not complete extra vocational services with clients who had no extra vocational services		
VOTE	**41.04**	**n.s.**
ACEP	**86.82**	**n.s.**
RRR	**-24.7**	**n.s.**
INTERCEPT	**132.88**	**0.001**

The overall model R squared is .1784 with a significance level of 0.0001.

NOTE: Blank cell or "n.s." = not significant regression coefficient of earnings with given independent variable.

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Figure 4
PERCENT OF ANY EMPLOYMENT
in the 18 Month Follow-Up Period
by Background Characteristics of Clients in Three Pilot Vocational Programs and Those Receiving No Extra Vocational Services
(Non-Adjusted Results)

	Percent Any Employment				Significance of Correlation between Background Characteristics and Any Employment
	Extra Vocational Services by Pilot Program			No Extra Vocational Services	
Background Characteristics	VOTE n=312	ACEP n=103	RRR n=92	n=132	
Education					
Less Than High School	62%	55%	74%	51%	sign.
High School Graduate	64%	66%	73%	63%	
More than High School	61%	71%	57%	57%	
Employment Before Treatment					
Not Employed Before Treatment *	40%	47%	53%	18%	sign.
Employed Before Treatment	90%	81%	87%	78%	
Age					
Less than 30 yrs	65%	85%	74%	75%	n.s.
30 yrs or more	63%	61%	69%	48%	
Ethnicity					
White	60%	61%	67%	56%	n.s.
Non-white	66%	68%	100%	57%	
Gender					
Men	64%	65%	70%	58%	n.s.
Women	59%	62%	75%	48%	
Marital Status					
Single	65%	65%	69%	53%	n.s.
Married	40%	56%	86%	84%	

NOTE: sign. = significant at .05 level
n.s. = not significant

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Figure 5

PERCENT OF SUBSTANTIVE-CONTINUOUS EMPLOYMENT

In the 18 month Follow-Up Period

By Background Characteristics of Clients in Three Pilot Vocational Programs and Those Receiving No Extra Vocational Services

(Non-Adjusted Results)

	Percent Substantive Employment				
	Extra Vocational Services by Pilot Program			No Extra Vocational Services	Significance of Difference between Background Characteristic Subgroups in Substantive Employment
	VOTE	[illegible]	[illegible]		
Background Characteristic	n=312	n=103	n=92	n=152	
Education					
[illegible]	23%	16%	16%	12%	sign.
[illegible]	24%	27%	22%	12%	
[illegible]	26%	26%	21%	33%	
Employment Before Treatment					
[illegible]	10%	18%	13%	8%	sign.
[illegible]	41%	29%	26%	24%	
Age					
[illegible]	25%	31%	20%	23%	n.s.
[illegible]	25%	22%	19%	16%	
Ethnicity					
[illegible]	25%	31%	20%	21%	n.s.
[illegible]	20%	26%	20%	15%	
Gender					
[illegible]	27%	23%	20%	21%	trend
[illegible]	18%	26%	17%	7%	
Marital Status					
[illegible]	25%	23%	19%	18%	n.s.
[illegible]	24%	22%	20%	21%	

NOTE: sign. = significant at .05 level
n.s. = not significant

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Figure 6
AVERAGE MONTHLY EARNINGS
In the 18 Month Follow-Up Period
By Background Characteristics for Clients in Three Pilot Vocational Programs and Those Receiving No Extra Vocational Services
(Non-Adjusted Results)

	MONTHLY EARNINGS				
	Vocational Service by Pilot Program			No Extra Vocational Service	Significance of Correlation Between Background Characteristics and Average Monthly Earnings
	VOTE	ACRP	RRR		
Number of Cases	n=312	n=103	n=92	n=132	
Education					
[illegible]	$239	[illegible]	$144	$178	sign.
[illegible]	$308	$477	$278	$253	
[illegible]	$335	$482	$397	$265	
Employment Before Treatment					
[illegible]	$127	$241	$211	$53	sign.
[illegible]	$504	$559	$331	$283	
Age					
[illegible]	$314	$379	$275	$152	n.s.
[illegible]	$290	$555	$268	$308	
Ethnicity					
[illegible]	$300	$425	$261	$240	n.s.
[illegible]	$268	$373	$369	$144	
Gender					
[illegible]	$352	$424	$270	$327	sign.
[illegible]	$199	$311	$289	$94	

NOTE: sign. = significant at .05 level
n.s. = not significant

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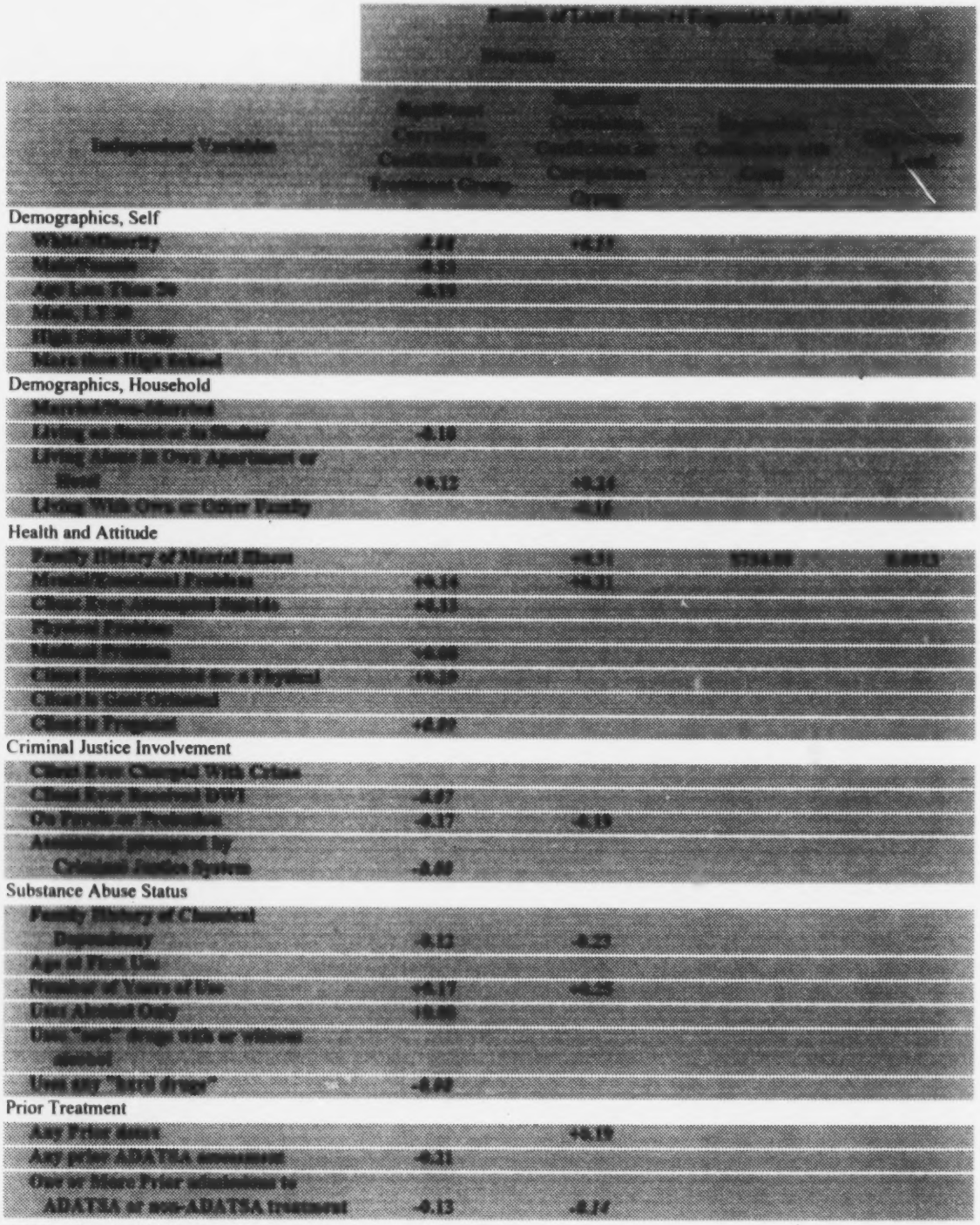
APPENDIX 4
Statistical Models for Chapter 4

Figure 1
Statistical Model of
INCOME ASSISTANCE COSTS
The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Regular Clients' Income Assistance Costs in the 12 Month Follow-Up Period



Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Significant Correlation with Costs	Significance Level
Demographics, Self				
White/Minority	-0.08	+0.07		
Male/Female	-0.03			
Age Less Than 26	-0.09			
Male, 27-30				
High School Only				
More than High School				
Demographics, Household				
Married/Not Married				
Living on Reserve or in Shelter	-0.10			
Living Alone in Own Apartment or Hotel	+0.12	+0.16		
Living With Own or Other Family		-0.05		
Health and Attitude				
Family History of Mental Illness		+0.31	7744.00	0.0013
Mental/Emotional Problem	+0.16	+0.21		
Client Rates Emotional Health	+0.13			
Physical Problem				
Medical Problem	+0.08			
Client Recommended for a Physical	+0.09			
Client is Self-Employed				
Client is Pregnant	+0.09			
Criminal Justice Involvement				
Client Ever Charged With Crime				
Client Ever Received DWI	-0.07			
On Parole or Probation	-0.17	-0.19		
Assistance prompted by Criminal Justice System	-0.09			
Substance Abuse Status				
Family History of Chemical Dependency	-0.12	-0.23		
Age of First Use				
Number of Years of Use	+0.17	+0.25		
Uses Alcohol Only	-0.09			
Uses "soft" drugs with or without alcohol				
Uses any "hard drugs"	-0.09			
Prior Treatment				
Any Prior detox		+0.19		
Any prior ADATSA assessment	-0.21			
One or More Prior admissions to ADATSA or non-ADATSA treatment	-0.13	-0.14		

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Independent Variables	Significant Correlation Coefficient for Treatment Group	Significant Correlation Coefficient for Comparison Group	Regression Coefficient (B)	Significance Level
Prior Public Service Costs				
[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
[illegible]				
Gateway				
[illegible]	[illegible]	[illegible]		
Prior Employment				
[illegible]				
[illegible]	[illegible]	[illegible]		
Treatment Status				
[illegible]				
[illegible]			[illegible]	[illegible]
[illegible]				
Treatment Interactions				
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
Model Intercept				
[illegible]			$441.00	0.0004

Proportion of the total variance explained by the statistical model: R squared = .19

Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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Figure 2
Statistical Model of
PARTICIPATION IN AN INCOME ASSISTANCE PROGRAM
The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Reagular Clients' Participation in an Assistance Program in the 12 Month Follow-Up Period

	Results of Logistic Regression Analysis			
	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Participation	Significance Level
Demographics, Self				
White/Minority				
Male/Female	-0.16		-0.64	0.0115
Age Less Than 30	-0.16			
Male, LT 30				
High School Only				
More than High School				
Demographics, Household				
Married/Non-Married				
Living on Street or in Shelter	-0.09			
Living Alone in Own Apartment or Hotel				
Living With Own or Other Family	+0.15			
Health and Attitude				
Family History of Mental Illness		+0.20	+0.82	0.1367
Mental/Emotional Problem	+0.13	*+0.13*		
Client Ever Attempted Suicide	+0.14			
Physical Problem		+0.11	+1.23	0.0181
Any health variable present	+0.11	+0.14	+1.23	0.0128
Medical Problem	+0.07			
Client Recommended for a Physical	+0.16	+0.20		
Client is Goal Oriented				
Client is Pregnant	*+0.07*			
Criminal Justice Involvement				
Client Ever Charged With Crime				
Client Ever Received DWI				
On Parole or Probation	-0.11	-0.22		
Assessment prompted by Criminal Justice System	-0.07	*-0.13*		
Substance Abuse Status				
Family History of Chemical Dependency	-0.07	-0.16		
Age at First Use				
Number of Years of Use	+0.18			
Uses Alcohol Only				
Uses "soft" drugs with or without alcohol				
Uses any "hard drugs"				
Prior Treatment				
Any Prior detox				
Any prior ADATSA assessment	+0.20			
One or More Prior admissions to ADATSA or non-ADATSA treatment	-0.10	-0.15	-1.44	0.004

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	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Participation	Significance Level
Prior Public Service Costs				
Total Prior Costs	+0.19			
Prior Income Assistance	+0.37	+0.27	+0.0007	0.0003
All Prior Medical Costs		-0.15	-0.0004	0.0277
Prior Inpatient Medical Costs		-0.14		
Prior Outpatient Medical Costs				
Prior Inpatient Treatment Costs	+0.08			
Prior Outpatient Treatment Costs				
All Prior Treatment Costs				
Gateway				
"Gateway": no public assistance or treatment in previous year	-0.23			
Prior Employment				
Prior Employment				
Average monthly pre-tx wage				
Treatment Status				
Outpatient tx path				
Completed some tx or all				
Client Placed on Waiting List				
Treatment Interactions				
Client Recommended for Physical and Tx			-0.58	0.3612
Any health variable present and Tx			-0.81	0.1197
One or more prior admissions and Tx			+0.87	0.1217
Family History of Mental Illness and Tx			-0.57	0.3772
Prior Income Assistance and Tx			-0.00004	0.8559
All Prior Medical Costs and Tx			+0.00032	0.0592
Model Intercept				
Intercept			-0.91	0.0028

Association of Predicted Probabilities and Observed Responses: **Concordant = 74.5%** **Tied = 1.2%**
Discordant = 24.2% **(42780 pairs)**

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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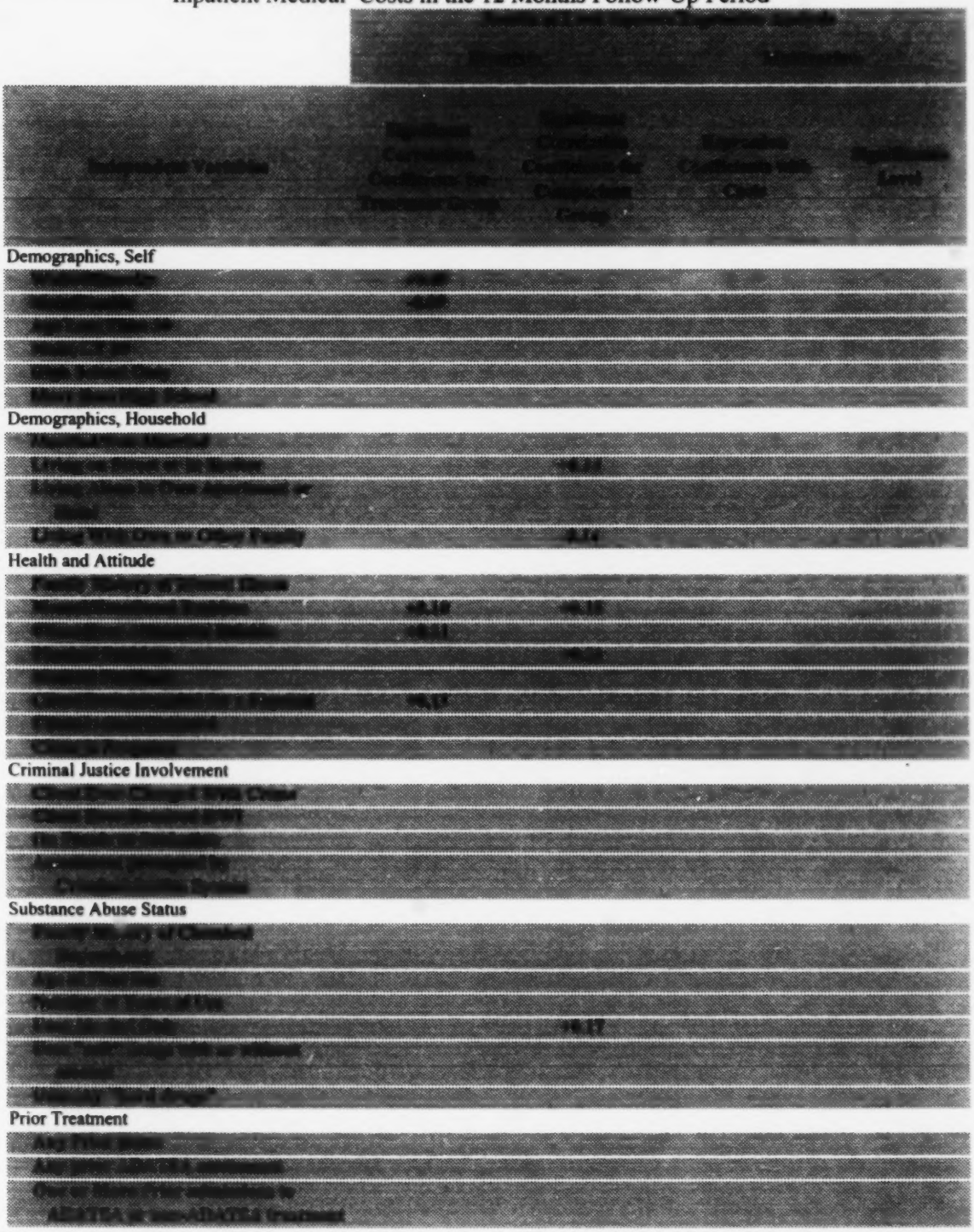
Figure 3
Statistical Model of
INPATIENT MEDICAL COSTS

The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Regular Clients' Inpatient Medical Costs in the 12 Months Follow-Up Period



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Prior Public Service Costs				
Gateway				
Prior Employment				
	-0.07	-0.16		
Treatment Status				
	-0.04			
Treatment Interactions				
Model Intercept				

Proportion of the total variance explained by the statistical model: R squared = .30

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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Figure 4
Statistical Model of
OUTPATIENT MEDICAL COSTS

The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Regular Clients' Outpatient Medical Costs in the 12 Month Follow-Up Period

	Results of Regression Analysis			
	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Cases	Significance Level
Demographics, Self				
White/Minority				
Male/Female				
Age Less Than 30	-0.13			
Male, LT 30				
High School Only	-0.09			
More than High School				
Demographics, Household				
Married/Non-Married				
Living on Street or in Shelter				
Living Alone in Own Apartment or Hotel	+0.23	+0.22		
Living With Own or Other Family	-0.17			
Health and Attitude				
Family History of Mental Illness	+0.15			
Mental/Emotional Problem	+0.26	+0.31		
Client Ever Attempted Suicide	+0.25			
Physical Problem	-0.25	+0.28		
Medical Problem	-0.11	+0.28		
Client Recommended for a Physical	+0.24	+0.26		
Client is Goal Oriented				
Client is Pregnant		+0.16	$633.00	0.0947
Criminal Justice Involvement				
Client Ever Charged With Crime				
Client Ever Received DWI	-0.12			
On Parole or Probation				
Assessment prompted by Criminal Justice System	-0.10			
Substance Abuse Status				
Family History of Chemical Dependency		-0.28	-$760.00	0.0177
Age at First Use				
Number of Years of Use				
Uses Alcohol Only				
Uses "soft" drugs with or without alcohol	+0.15			
Uses any "hard drugs"	-0.11			
Prior Treatment				
Any Prior detox				
Any prior ADATSA assessment	+0.16			
One or More Prior admissions to ADATSA or non-ADATSA treatment				

Independent Variables	Bivariate		Multivariate	
	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Costs	Significance Level
Prior Public Service Costs				
Total Prior Costs	+0.69	+0.34		
Prior Income Assistance	+0.12	+0.25		
All Prior Medical Costs	+0.73	+0.18		
Prior Inpatient Medical Costs				
Prior Outpatient Medical Costs	+0.57	+0.56	$0.69	0.0001
Prior Inpatient Treatment Costs	+0.10			
Prior Outpatient Treatment Costs				
All Prior Treatment Costs				
Gateway				
"Gateway": no public assistance or treatment in previous year	-0.15	*-0.14*		
Prior Employment				
Prior Employment				
Average monthly pre-tx wage	-0.13	-0.15		
Treatment Status				
Outpatient tx path		+0.20		
Completed some tx or all			-$918.00	0.0101
Client Placed on Waiting List	+0.12			
Treatment Interactions				
Male, LT 30 and treatment			$217.00	0.1667
Pregnant and treatment			$2,273.00	0.0458
Family History of Chemical Dependency and Treatment			$1,592.00	0.0036
Treatment Outpatient Medical Costs and Treatment			$0.26	0.014
Model Intercept				
Intercept			$921.00	0.0029

Proportion of the total variance explained by the statistical model: R squared = .61

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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APPENDIX 5
Statistical Models for Chapter 5

Figure 1
Statistical Model of
COSTS INCURRED IN INPATIENT TREATMENT RE-ENTRY
The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Regular Clients' Inpatient Re-entry Costs in the 12 Months Follow-Up Period

	Results of Least Squares Regression Analysis			
	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Costs	Significance Level
Demographics, Self				
White/Minority		-0.14		
Male/Female		+0.13		
Age Less Than 30	-0.32	-0.38	-$725.00	+0.0022
Male, LT 30				
High School Only				
More than High School				
Demographics, Household				
Married/Not-Married		-0.13		
Living on Street or in Shelter	+0.20	+0.34		
Living Alone in Own Apartment or Hotel				
Living With Own or Other Family	-0.17	-0.15		
Health and Attitude				
Family History of Mental Illness				
Mental/Emotional Problem	+0.21			
Client Ever Attempted Suicide	+0.09			
Physical Problem	+0.14			
Medical Problem	+0.08			
Client Recommended for a Physical				
Client is Goal Oriented				
Client is Pregnant				
Criminal Justice Involvement				
Client Ever Charged With Crime		-0.13		
Client Ever Received DWI				
On Parole or Probation	-0.09			
Assessment prompted by Criminal Justice System	-0.10			
Substance Abuse Status				
Family History of Chemical Dependency				
Age at First Use				
Number of Years of Use	+0.13	+0.25	$29.00	0.0000
Uses Alcohol Only				
Uses "soft" drugs with or without alcohol				
Uses any "hard drugs"		-0.19		
Prior Treatment				
Any Prior detox	+0.19	+0.23		
Any prior ADATSA assessment	+0.12	+0.31		
One or More Prior admissions to ADATSA or non-ADATSA treatment	+0.15	+0.18		

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Independent Variables	Bivariate: Significant Correlation Coefficients for Treatment Group	Bivariate: Significant Correlation Coefficients for Comparison Group	Multivariate: Regression Coefficients with Costs	Multivariate: Significance Level
Prior Public Service Costs				
[illegible]	[illegible]			
[illegible]				
[illegible]	[illegible]			
[illegible]				
[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				
[illegible]				
Gateway				
[illegible]	[illegible]	[illegible]		
Prior Employment				
[illegible]				
[illegible]	[illegible]	[illegible]		
Treatment Status				
[illegible]	[illegible]			
[illegible]			[illegible]	[illegible]
[illegible]				
Treatment Interactions				
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
[illegible]			[illegible]	[illegible]
Model Intercept				
[illegible]			[illegible]	[illegible]

Proportion of the total variance explained by the statistical model: R squared = .21

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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Figure 2
Statistical Model of
RE-ENTRY INTO INPATIENT TREATMENT

The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Regular Clients' Re-entry into Inpatient Treatment in the 12 Month Follow-Up Period

	Results of Logistic Regression Analysis			
	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Re-entry	Significance Level
Demographics, Self				
[redacted]				
[redacted]	-0.08	+0.17	+0.61	0.1154
[redacted]	-0.19	-0.22		
[redacted]				
[redacted]				
[redacted]				
Demographics, Household				
[redacted]		-0.15		
[redacted]	+0.09			
[redacted]				
[redacted]	-0.14	-0.11		
Health and Attitude				
[redacted]	+0.08	+0.23		
[redacted]	+0.13	+0.22	+1.09	[redacted]
[redacted]	+0.11	+0.15		
[redacted]	+0.17			
[redacted]	+0.09			
[redacted]	+0.14			
[redacted]		-0.34		
[redacted]				
Criminal Justice Involvement				
[redacted]				
[redacted]	+0.08			
[redacted]	-0.11			
[redacted]	-0.10			
Substance Abuse Status				
[redacted]	-0.18			
[redacted]				
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	+0.17		
[redacted]				
[redacted]	-0.14	-0.12		
Prior Treatment				
[redacted]	+0.18	+0.35		
[redacted]	+0.19	+0.31	+1.31	[redacted]
[redacted]				

Independent Variables	Bivariate: Significant Correlation Coefficients for Treatment Group	Bivariate: Significant Correlation Coefficients for Comparison Group	Multivariate: Regression Coefficients with Re-entry	Multivariate: Significance Level
Prior Public Service Costs				
[illegible]	+0.19			
[illegible]	+0.23	+0.11		
[illegible]	+0.07	-0.17		
[illegible]		-0.17		
[illegible]				
[illegible]	+0.17	+0.17		
[illegible]				
[illegible]				
Gateway				
[illegible]	-0.13	-0.22		
Prior Employment				
[illegible]				
[illegible]	-0.14			
Treatment Status				
[illegible]		-0.20		
[illegible]				
[illegible]				
Treatment Interactions				
[illegible]			+0.88	0.8501
[illegible]			-0.80	0.0078
[illegible]			-0.65	0.1304
[illegible]			-0.46	0.3377
[illegible]			+0.47	0.0039
[illegible]			-0.82	0.005
Model Intercept				
[illegible]			-2.44	0.0001

Association of Predicted Probabilities and Observed Responses: **Concordant = 72.0%** **Tied = 0.3%**
Discordant = 27.7% **(56052 pairs)**

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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Figure 3
Statistical Model of
COSTS INCURRED IN OUTPATIENT TREATMENT RE-ENTRY
The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Regular Clients' Outpatient Re-entry Costs in the 12 Months Follow-Up Period

	Results of Least Squares Regression Analysis			
	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Costs	Significance Level
Demographics, Self				
White/Minority	+0.13			
Male/Female				
Age Less Than 30		-0.13		
Male/F/30				
High School Only				
More than High School		+0.11		
Demographics, Household				
Married/Not Married				
Living on Street or in Shelter		-0.12		
Living Alone in Own Apartment or Hotel	+0.18	+0.16		
Living With Own or Other Family	-0.11			
Health and Attitude				
Family History of Mental Illness				
Mental/Emotional Problem	-0.14			
Client Ever Attempted Suicide				
Physical Problem				
Medical Problem				
Client Recommended for a Physical		+0.22		
Client is Goal Oriented				
Client is Pregnant	+0.44			
Criminal Justice Involvement				
Client Ever Charged With Crime				
Client Ever Received DWI				
On Parole or Probation	+0.07			
Admission prompted by Criminal Justice System	+0.15			0.0918
Substance Abuse Status				
Family History of Chemical Dependency				
Age at First Use of				
Frequency of Use				
Use in Past Month	-0.11			
Have Used drugs with or without alcohol				
Use any "Hard Drugs"	-0.09			
Prior Treatment				
Any Prior Tests				
Any prior ADATSA assessment				
Days in Prior Treatment in ADATSA or non-ADATSA treatment		+0.12		

	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Costs	Significance Level
Prior Public Service Costs				
Total Prior Costs		+0.25		
Prior Income Assistance		+0.23		
All Prior Medical Costs		*+0.12*		
Prior Inpatient Medical Costs				
Prior Outpatient Medical Costs		+0.08		
Prior Inpatient Treatment Costs		+0.08		
Prior Outpatient Treatment Costs		+0.17	$0.50	0.0376
All Prior Treatment Costs				
Gateway				
"Gateway": no public assistance or treatment in previous year		*-0.13*		
Prior Employment				
Prior Employment				
Average monthly pre-tx wage				
Treatment Status				
Outpatient tx path		+0.36		
Completed some tx or all				
Client Placed on Waiting List				
Treatment Interactions				
White and Treatment			$219.00	0.0001
Living Alone in Apt. or Hotel and Tx			$291.00	0.0001
Medical Problems and Treatment			-$215.00	0.0001
Assessment Prompted by Criminal Justice System			$168.00	0.0069
Total Pre-Treatment Outpatient Treatment Costs and Treatment			-$0.90	0.0621
Total Pre-Treatment Outpatient Medical Costs and Treatment			-$0.13	0.0236
Model Intercept				
Intercept			$16.63	0.6863

*** Proportion of the total variance explained by the statistical model: R squared = .44**

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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Figure 4
Statistical Model of
RE-ENTRY INTO OUTPATIENT TREATMENT

The Effects of Client Characteristics, Pre-Treatment Experiences and Treatment on Regular Clients' Re-entry into Outpatient Treatment in the 12 Month Follow-Up Period

	Results of Logistic Regression Analysis			
	Direction		Importance	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Re-entry	Improvement Level
Demographics, Self				
White/Minority	+0.11			
Male/Female	-0.11	-0.19	1.21	0.0743
Age Less Than 30	-0.09	-0.10		
Male, 18-30				
High School Only				
More than High School	+0.08			
Demographics, Household				
Married/Not-Married				
Living on Street or in Shelter	-0.14			
Living Alone in Own Apartment or Hotel		-0.12		
Living With Own or Other Family	+0.15	+0.14		
Health and Attitude				
Family History of Mental Illness		-0.11		
Mental/Emotional Problem	+0.09			
Client Ever Attempted Suicide	+0.15			
Physical Problem		+0.16		
Medical Problem	-0.13			
Client Recommended for a Physical		+0.20		
Client is Gay Orientated				
Client is Pregnant	+0.08			
Criminal Justice Involvement				
Client Ever Charged With Crime				
Client Ever Received DWI	+0.07			
On Parole or Probation	+0.10			
Assessment prompted by Criminal Justice System	+0.10	+0.12		
Substance Abuse Status				
Family History of Chemical Dependency		-0.10	-1.21	0.1074
Age at First Use		+0.13		
Number of Years of Use				
Uses Alcohol Only	+0.09			
Uses "soft" drugs with or without alcohol				
Uses any "hard drugs"	-0.07			
Prior Treatment				
Any Prior detox				
Any prior ADATSA assessment				
One or More Prior admissions to ADATSA or non-ADATSA treatment				

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	Bivariate		Multivariate	
Independent Variables	**Significant Correlation Coefficients for Treatment Group**	**Significant Correlation Coefficients for Comparison Group**	**Regression Coefficients with Re-entry**	**Significance Level**
Prior Public Service Costs				
Total Prior Costs	**+0.10**	**+0.13**		
Prior Income Assistance	**+0.09**	***+0.15***		
All Prior Medical Costs	**+0.10**			
Prior Inpatient Medical Costs				
Prior Outpatient Medical Costs	**+0.17**	**+0.43**	**0.00103**	**0.0091**
Prior Inpatient Treatment Costs		**+0.19**		
Prior Outpatient Treatment Costs		**+0.38**	**0.01**	**0.0077**
All Prior Treatment Costs				
Gateway				
"Gateway": no public assistance or treatment in previous year				
Prior Employment				
Prior Employment				
Average monthly pre-tx wage				
Treatment Status				
Outpatient tx path				
Completed some tx or all			**2.12**	**0.1085**
Client Placed on Waiting List	**+0.08**			
Treatment Interactions				
Male/Female and Tx			**-2.65**	**0.017**
White/Minority and Tx			**0.65**	**0.0324**
Medical Problem and Tx			**-0.85**	**0.0019**
Client Ever Attempted Suicide and Tx			**0.71**	**0.0336**
Family History of Chemical Dependency and Tx			**1.17**	**0.1679**
Living With Own or Other Family and Tx			**0.81**	**0.0061**
Assessment Prompted by CriminalJustice System and Tx			**0.95**	**0.003**
Prior Outpatient Tx Costs and Tx			**-0.01**	**0.0154**
Prior Outpatient Medical Costs and Tx			**-0.0008**	**0.0078**
Model Intercept				
Intercept			**-3.82**	**0.002**

Association of Predicted Probabilities and Observed Responses: **Concordant = 70.6%** **Tied = 1.5%** **Discordant = 27.9%** **(51912 pairs)**

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

APPENDIX 6

Statistical Models for Chapter 6

Figure 1
Statistical Model of
TOTAL PUBLICLY FUNDED SERVICES COSTS
The Effects of Client Characteristics, Pre-Treatment Experiences And Treatment on Regular Clients' Total Post Public Assistance Costs In the 12 Month Follow-Up Period

	Results of Regression Analysis			
	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	Regression Coefficients with Costs	Significance Level
Demographics, Self				
White/Minority	+0.09			
Male/Female	-0.11			
Age Less Than 30	-0.17			
Male, 31-50				
High School Only				
More than High School				
Demographics, Household				
Married/Other-Married		-0.15		
Living on Street or in Shelter		+0.12		
Living Alone in Own Apartment or Hotel	+0.09	+0.15		
Living With Own or Other Family	-0.17	-0.24		
Health and Attitude				
Family History of Mental Illness	+0.13			
Mental Impairment Problems	+0.28	+0.26		
Client Has Attempted Suicide	+0.28			
Physical Problems	+0.09	+0.25		
Dependent Personality	+0.10			
Client Recommended for a Physical	+0.24	+0.23		
Client is Goal Oriented				
Client is Pregnant	+0.65			
Criminal Justice Involvement				
Client Ever Charged With Crime				
Client Ever Received DWI	-0.09			
On Parole or Probation				
Assessment prompted by Criminal Justice System	-0.18		$707	0.0918
Substance Abuse Status				
Family History of Chemical Dependency		-0.24		
Age at First Use				
Number of Years of Use	+0.08	+0.33		
Uses Alcohol Only		+0.26		
Uses "both" drugs with or without alcohol				
Uses any "hard drugs"		-0.19		
Prior Treatment				
Any Prior Detox	+0.12	+0.19		
Any prior ADATSA assessment	+0.22	+0.19		
One or More Prior admissions to ADATSA or non-ADATSA treatment				

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	Bivariate		Multivariate	
Independent Variables	Significant Correlation Coefficients for Treatment Group	Significant Correlation Coefficients for Comparison Group	R_ values Coefficients with Costs	Significance Level
Prior Public Service Costs				
[illegible]	+0.48	+0.33	3.33	0.0001
[illegible]	+0.31	+0.31		
[illegible]	+0.39			
[illegible]	+0.17			
[illegible]	+0.33	+0.31		
[illegible]	+0.19	+0.23		
[illegible]				
[illegible]				
Gateway				
"Gateway" to public assistance or treatment in previous year	-0.19	-0.22		
Prior Employment				
[illegible]		-0.29		
Average monthly pre-tx wage	-0.19	-0.16		
Treatment Status				
[illegible]	-0.16	+0.21		
[illegible]				
Client Placed on Waiting List				
Treatment Interactions				
[illegible]			-.5709	0.0999
[illegible]			-38.17	0.0481
Pregnant and treatment			14,352	0.0117
Mental problems and treatment			11,174	0.0184
Model Intercept				
Intercept			5760	0.0024

Proportion of the total variance explained by the statistical model: R squared = .44

NOTE: Blank cell = not significant correlation of costs with given independent variable in the bivariate analysis.
Italicized correlation coefficients = significant level between .05 and .10: trend only.

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Figure 2
COST AVOIDANCE RESULTS OF TREATMENT
by Type of Publicly Funded Services and "Gateway" Status
Calculated as the Difference in Follow-up Adjusted Costs
Between Treatment and Comparison Groups and
As the Difference Between Follow-Up Costs From Costs Before Treatment
for the Same Treated Clients
(Based on Statistically Adjusted Follow-Up Costs and
Non Adjusted Average Costs Before Treatment
for the Combined Treatment and Comparison Groups)*

	All Clients		Gateway Clients	Non- Gateway Clients	
	Tx-Comparison Differences	Before-After Differences	Tx-Comparison Differences	Tx-Comparison Differences	Before-After Differences
Total	$222	[$194]	[$314]	$491	$436
Income Assistance	[$68]	[$104]	[$68]	[$69]	$152
Inpatient Medical	$376	$200	$18	$554	$420
Outpatient Medical	[$120]	[$252]	[$14]	[$174]	[$248]
Inpatient Treatment Re-Entry	$102	$85	[$83]	$196	$196
Outpatient Treatment Re-entry	[$68]	[$123]	[$167]	[$16]	[$102]

NOTE: Positive cost avoidance indicates that post-treatment costs were lower for treated clients. Negative cost avoidance, [ ], indicates that post-treatment costs were higher for treated clients; that is, costs actually increased.

*Treatment and Comparison Group costs in the follow-up period were statistically adjusted using the statistical models in Appendix 4 and 5. Before Treatment Costs were adjusted by calculating the average before costs for all Treatment and Comparison Group clients and considering this combined average as the before cost for Treatment Group clients.

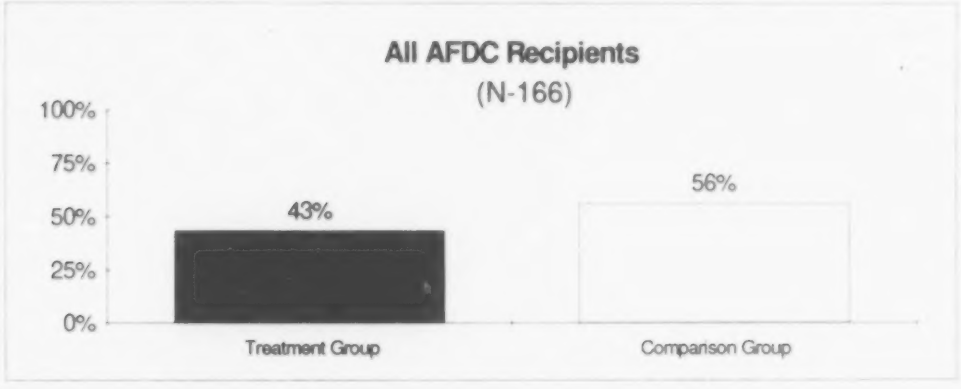
APPENDIX 7
Statistical Models for Chapter 7

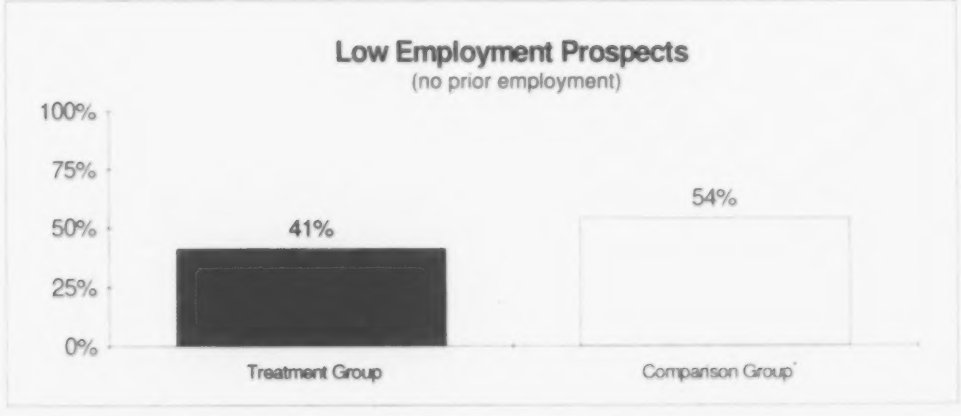
Figure 1
Statistical Model of
ADATSA Treatment Outcomes for AFDC RECIPIENTS:
Any Employment, Substantive-Continuous Employment and Average Monthly Earnings

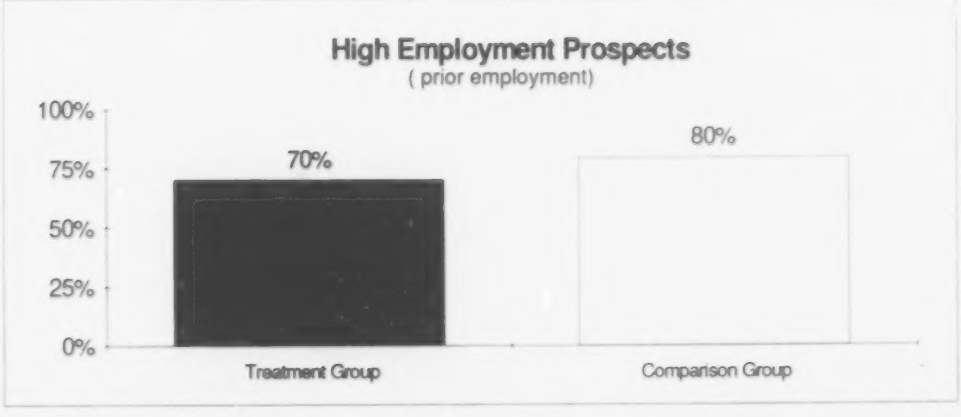
The Effects of Some Client Characteristics, Pre-Treatment Experiences and Treatment on Any Employment, Substantive-Continuous Employment and Average Monthly Earnings in the 18 Month Follow-Up Period

Independent Variables	Results of Regression Analysis: Any Employment		Substantive Employment		Earnings	
	Logistic Regression Coefficient	Significance Level	Logistic Regression Coefficient	Significance Level	Least Squares Regression Coefficient	Significance Level
Demographics, Self						
[redacted]					-$141	[redacted]
[redacted]					-$251	[redacted]
Health and Attitude						
[redacted]					$148	[redacted]
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
Prior Employment						
[redacted]	01.22	[redacted]	01.49	[redacted]		
[redacted]					$0.46	[redacted]
Treatment Status						
[redacted]	-00.52	[redacted]	01.69	[redacted]	$133	[redacted]
[redacted]						
Model Intercept						
[redacted]	00.16	[redacted]	-04.16	[redacted]	$23.88	[redacted]
	Chi Square = 14.037	p=0.0009	Chi Square = 15.399	p= 0.0005	R Squared = $0.24	p=0.0001
Weighted N's:	166		161			161.00

Figure 2
Any Employment Rates for AFDC RECIPIENTS
(Adjusted Rates Between Treatment and Comparison Groups in the 18 Month Follow-Up Period)*







* Rates have been tentatively adjusted for differences in client characteristics between Treatment and Comparison Groups. The adjustment was made for the factors affecting any employment of AFDC recipients in the follow-up period. (See the results of the logistical regression, Figure 1, Appendix 7.)

Figure 3
Statistical Models of
COSTS INCURRED BY AFDC RECIPIENTS
For Each Type of Publicly Funded and Overall in the 12 Month Follow-Up Period

Independent Variables	All Public Assistance Costs	Income Assistance	Inpatient Medical	Outpatient Medical	Re-entry into Inpatient Treatment	Re-entry into Outpatient Treatment
Additive Effects						
Age Less Than 30					$219	
Family History of Mental Illness		-$531				
Family History of Chemical Dependency				-$261		
Number of Years of Use					-$14	
Assessment prompted by Criminal Justice System	$1,716***					
Completed Some or All TX		-$966 *		-$220	-$264	
Total Prior Costs	$0.375					
Prior Income Assistance		$0.72**				
Prior Inpatient Medical						
Prior Outpatient Medical				$0.467**		$0.02
Prior Inpatient Treatment					$1.84	
Prior Outpatient Treatment						$0.89
Treatment Interactions						
Male LT 30 & TX	-$0.1086					
Total Prior Costs & TX	-$0.115					
Pregnant & TX	$1,119			$672**		
Mental Problems & TX	$2,893 **	$632			$111	
Family History of Mental Illness & TX		$1,026				
Age LT 30 & Treatment		$105			-$102	
Any Prior Assessment & TX		$230				
Any Prior Admits to TX & TX		$381			-$47	
Prior Income Assistance & TX		$0.028				
Family History of Chemical Dependency & TX				$176		
Prior Outpatient Medical & TX				-.286*		-$0.10
Living in Street or Shelter & TX					-$75	-$33
Number of Years of Use & TX					$31	
Outpatient TX Path & TX					-$58	
Gateway & TX					$659**	
Prior Inpatient TX & TX					-$1.78	
Race & TX						$332 **
Medical Problems & TX						$91
Assessment Prompted by Criminal Justice System						$392***
Prior Outpatient TX & TX						-$1.47
Model Intercept						
Intercept	$2,110***	$1,319*		$678**	$147	$33
R Squared =	0.18	0.47	0.004	0.17	0.09	0.21
*** Statistical Significance <.05	**Statistical Significance <.10		*Statistical Significance <.20			
Adjusted Costs						
Treatment Group	$4,108	$2,256	n.a.	$648	$183	$406
Comparison Group	$4,167	$2,481	n.a.	$741	$336	$94
Non-Adjusted Costs						
Treatment Group	$4,471	$2,448	$827	$691	$151	$394
Comparison Group	$4,438	$2,754	$663	$784	$44	$193

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Figure 4
Statistical Model of
ADATSA Treatment Outcomes
for FELONY OFFENDERS:
Any Employment, Substantive-Continuous Employment and
Average Monthly Earnings

The Effects of Some Client Characteristics, Pre-Treatment Experiences And Treatment on Any Employment Substantive-Continuous Employment and Average Monthly Earnings In The 18 Month Follow-Up Period

Independent Variables	Results of Regression Analysis: Any Employment		Substantive Employment		Earnings	
	Logistic Regression Coefficient	Significance Level	Logistic Regression Coefficient	Significance Level	Least Squares Regression Coefficient	Significance Level
Demographics, Self						
Male Less Than 30					$48.98	0.6968
Female Less Than 30					-$62.63	0.7032
Female, 30+					-$252	0.1052
More Than High School					$168	0.0223
More Than H.S. and No Mental Problems			2.11	0.0049		
Health and Attitude						
No Mental/Emotional Problem					$91.65	0.1388
Client Ever Attempted Suicide						
No Physical Problem						
No Medical Problem						
Client Recommended for a Physical						
Client is Goal Oriented						
Prior Employment						
Prior Employment	4.97	0.0013	0.72	0.6695		
Average monthly pre-tx wage					$0.13	0.3035
Treatment Status						
Completed Some but not all Tx vs Comparison Group	1.31	0.2012	0.18	0.9074	-$44.95	0.6637
Completed All Tx vs Some Tx	1.20	0.1343	1.52	0.2594	$78.97	0.1876
Treatment Interactions						
Prior Employment and Primary Tx	-3.01	0.0682	1.18	0.5903		
Prior Employment and Completed All Tx	-1.83	0.3340	-1.31	0.3957		
Male, LT 30 and Treatment					-$40.81	0.7703
Female, LT 30 and Treatment					$179	0.3418
Female 30+ and Treatment					$461	0.0009
Model Intercept						
Intercept	-2.16	0.0179	-3.51	0.0046	554.18	0.6185
	Chi Square = 36.65	p= 0.0001	Chi Square = 14.60	p= 0.0236	R Squared = $ 0.09	p= 0.0262
Weighted N's	118.00		108.00		124.00	

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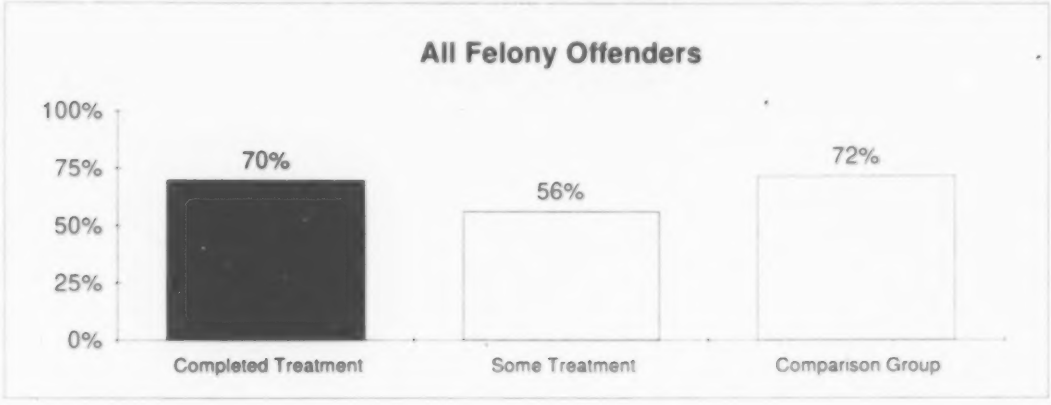
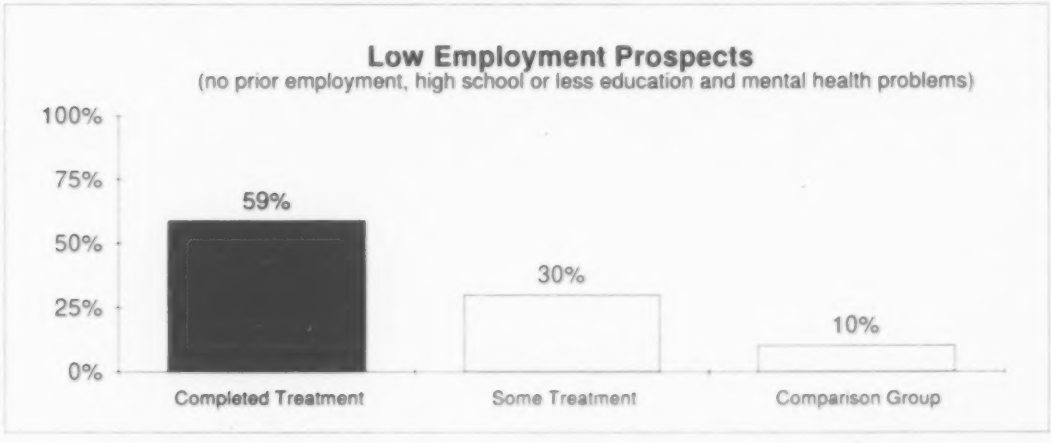
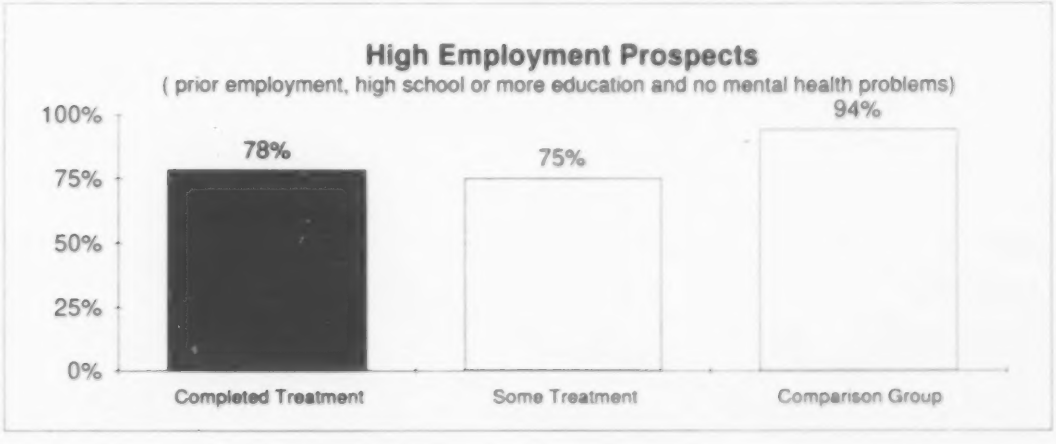
Figure 5
Any Employment Rates for
FELONY OFFENDERS
(Adjusted Rates Among Those Completing All or Some Treatment and Those in the Comparison Group In the 18 Month Follow-Up Group)







* Rates have been tentatively adjusted for differences in client characteristics among Treatment Completers, Non-Completers and the Comparison Group. The adjustment was made for the factors affecting any employment of felony offenders in the follow-up period. (See the results of the logistical regression, Figure 4, Appendix 7.)

Figure 6
Statistical Models of
COSTS INCURRED BY FELONY OFFENDERS
For Each Type of Publicly Funded Service and Overall in the 12 Month Follow-Up Period

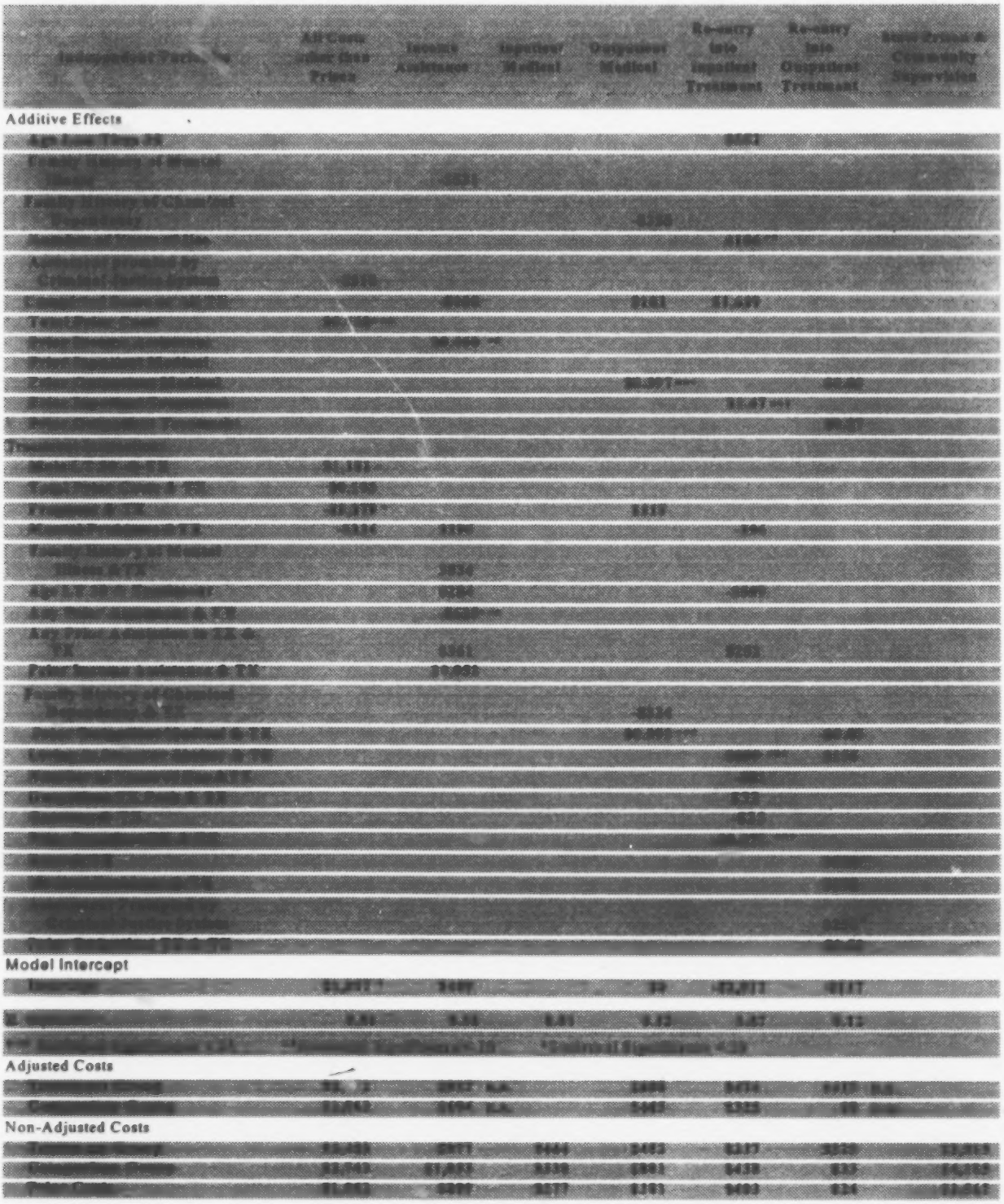


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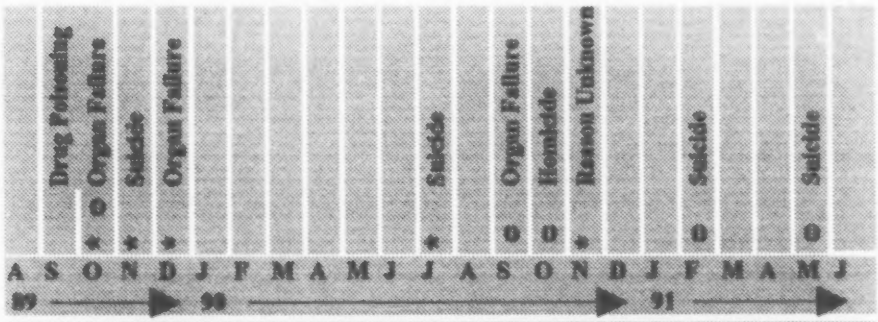
Figure 7
DEATHS OBSERVED IN 18 MONTH FOLLOW-UP PERIOD*
By Month in Which Death Occurred
By Whether Death Was Drug Related
And by Cause of Death
For Treatment and Comparison Group Clients
(After Treatment or Assessment)



* 5 Comparison Group Clients: (1 woman, 1 man<30, 3 men over 30) (w=4.29)

Drug Related/Not Drug Related	Cause of Death
1 drug related (w=1.3)	2 suicides (w=1.1)
3 not drug related (w=2.5)	2 organ failures (w=2.7)
1 reason unknown (w= 0.5)	1 reason unknown (w=0.5)

0 5 Treatment Group clients: (1 woman<30, 4 men over 30) (w=7.45)

Drug Related/Not Drug Related	Cause of Death
4 drug related (w=5.3)	2 suicides (w=0.9)
1 not drug related (w=2.2)	1 organ failure (w=2.2)
	1 drug poisoning (w=2.2)
	1 homicide (w=2.2)

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